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Building Cost Still High—Page 25

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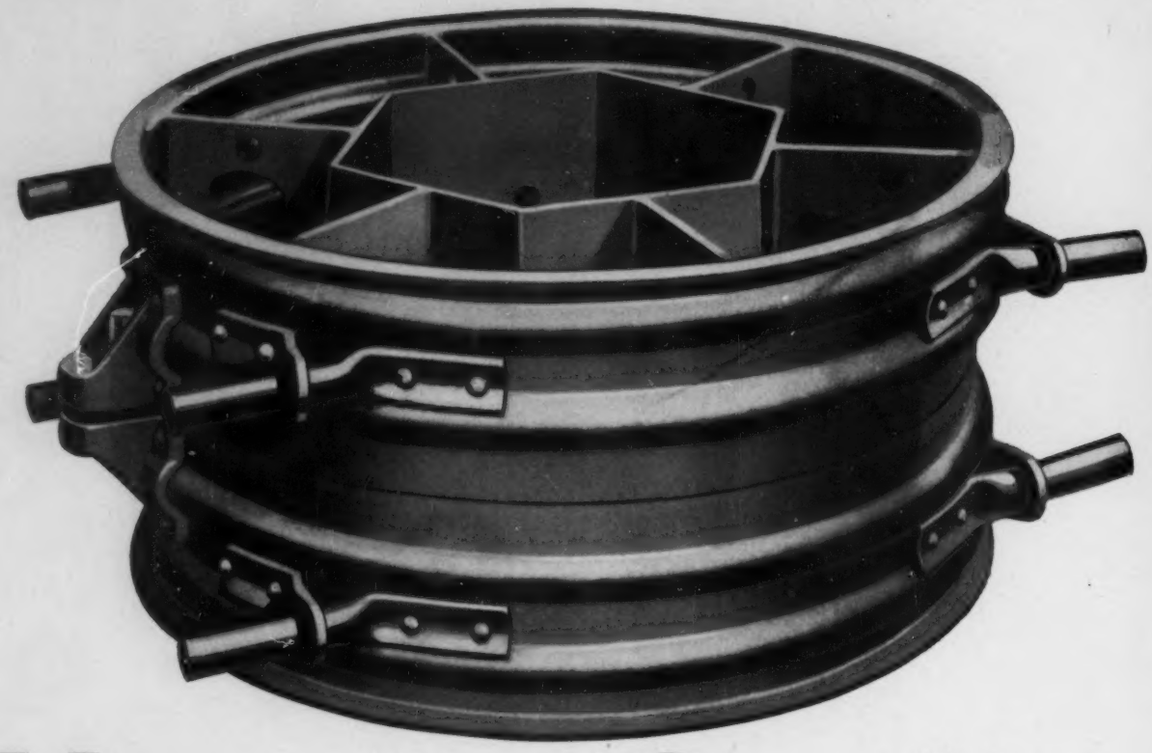

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IRON TRADE REVIEW
Registration Applied For
The Authority of Industry National and International
Vol. LXXIII Cleveland, July 5, 1923 No. 1

Production Keeps In High Gear

Backward Volume of New Business Still Has Little Effect on Operations—June Pig Iron Output Second Highest on Record—Exports Are Increasing—Sharp Advances Adopted in Hot-Rolled Extras

HEAVY production and shipments but a halting condition of new business still describe the iron and steel situation. How long this condition can continue without developing some soft spots is the unsettled question. Large producers are inclined to believe the present lull will extend well through the summer and are adjusting themselves to that expectation. They are comfortably filled for months ahead but this is not the case with the smaller mills which, however, are maintaining their position from the miscellaneous run of orders now coming out in a very fair volume. The market though sluggish is free of any marks of real weakness and the way that consumers unfailingly are taking in their tonnage has much potential promise for the future.

Such drags as now are imposed upon production are those of weather conditions, labor shortages and normal shutdowns at this season. Sheet mill operations this week are down to about 50 per cent for the annual cessation over the Fourth which will continue at a number of plants into next week. Primary departments such as blast furnaces and steelworks are keeping to a full gait. In fact several blast furnaces went in the past week.

Drooping pig iron prices continue to depress IRON TRADE REVIEW composite of fourteen leading iron and steel products. This week the composite registers $45.72 against $46.16 last week, an average of $46.46 in June and a recent high mark of $47.70.

Iron Output Holding

The amazing record of pig iron production for the past four months is holding up well considering the unfavorable season for blast furnace operations. June shows a daily average of 122,450 tons of coke iron or only measurably below the high mark of 124,790 tons in May. The June total was 3,673,503 tons as against 3,868,486 tons in May and 3,546,308 tons in April. Output of merchant furnaces in June actually showed a gain of 614 tons a day. Furnaces in blast also increased, 324 being active the last day of the month against 322 the corresponding date in May. Total production of pig iron for the first half was 20,834,136 tons or at the approximate annual rate of 42,000,000 tons.

Bar Extras Raised

New and higher extras on hot-rolled steel bars put out this week by leading producers are important in the extent of the changes, which are the most comprehensive in a number of years and in the amount of the advances, which range from $2 to $10 per ton. The present extra list on steel bars was adopted May 22, 1918 and has been subject to only slight revisions since. The new schedule which is expected to be followed by all producers, represents a complete effort to remove inequalities between various sizes and forms and to bring charges more in line with presentday manufacturing costs. The higher extras will be applied to all shipments following the distribution of the new cards this week.

Iron and steel exports are steadily rising, the 195,535 tons in May being the highest since June, 1922. Imports in May were about stationary at 75,840 tons of which 39,764 tons was pig iron. The latter was among the smallest in a number of months.

Unsettlement of the oil market has failed to check new field construction. This week shows a number of additional awards for storage tanks including 3000 tons for the Humble Oil Co., 2000 tons for the Cosden Oil Co., 1500 tons for the Sinclair Oil Co. and 30 tanks for the Phillips Petroleum Co. An inquiry for 250 miles of 4 and 6-inch line pipe has appeared from Toronto. The Texas Co. has made a new purchase of 75,000 boxes of tin plate.

Steel Stacks Selling

Competition of steelmakers particularly in steelmaking metal is forcing a further fall of pig iron prices and this influence has extended over a widening area. A 3000-ton sale of basic went this week at $25.50, valley, a drop of $1.50. Prices are down 50 cents to $1 again in other grades and at various selling points. The larger Alabama makers have not discarded $27, Birmingham, however, and are making a few sales. Buyers continue to close sparingly for the future with the tonnage totaling somewhat larger. A Trenton consumer was another buyer of a tonnage of foreign iron this week.

Business Trend and Chart Section Page 25

Pig Iron Prices Sink Lower

Competition of Steelworks Furnaces Is Dominating Factor in Present Unsettled Market—Valley Basic Sells Down to $25.50—Prices Lower in all Territories—Buyers Close Only for Nearby Delivery

PITTSBURGH, July 3.—While all grades of pig iron have manifested further weakness, the greatest decline, namely $1.50 per ton, has been in connection with basic. After the sale of this grade involving 1100 tons at $27 valley, reported in last week's IRON TRADE REVIEW another purchase was made at the same level from a valley producer amounting to 2500 tons. This was followed by a sale of 1000 tons at $26 valley. An inquiry then becoming current for 3000 tons developed quotations as low as $25.50 valley in several directions. This latter tonnage was divided among two or more producers. One merchant interest in the valley took 500 tons at the $25.50 valley level. Steel works competition from at least three angles is becoming keener. One or two steel companies located in the immediate vicinity of Pittsburgh, one in the Mahoning valley and one interest located east of Pittsburgh all are offering steelmaking iron. The latter interest, however, has been quoting $27 furnace. The Pittsburgh Steel Foundry Co. has closed on 500 tons from a nearby steel interest at an understood figure of $27 delivered. A nearby steelmaker has entertained basic quotations on the basis of $25 valley and small lots have been sold by another Pittsburgh steelmaker at $25.50 f. o. b. furnace. Bessemer is down $1 to $27 valley. Several small sales, including one of 200 tons, having been closed at that level. Only occasional small requirements develop, usually single carloads. One inquiry is current here, involving 3000 tons of malleable for the Link Belt Co., Indianapolis, but this doubtless will be closed in Ohio or further west. This grade is quoted at $26 to $26.50, the former figure now being freely offered on sizable lots. The No. 2 foundry (1.75 to 2.25 silicon) has declined another 50 cents, going to $26.50 and $27 valley. The Bethlehem Steel Co. is quoting $27 f. o. b. Johnstown, but recent purchasers, including the Pittsburgh Valve Foundry & Construction Co., have bought on the basis of $26.50, valley. This buyer closed at $26.50 base Youngstown, instead of Johnstown, as incorrectly reported one week ago. The same seller closed with the Westinghouse Electric & Mfg. Co., on 750 tons of No. 2X and No. 1 foundry iron for its Cleveland plant on the basis of $26.50 valley for the No. 2 grade. The Youngstown Foundry & Machine Co. closed last week on 400 tons on approximately the same basis. Other small sales of foundry iron have brought $26.50 to $27 valley, or around $27 Dunbar; Gray forge is quoted at $26 to $26.50 valley, with no inquiries out. Low phosphorus copper-free iron is offered at $33 f. o. b. Lebanon, Pa., and $35 valley. It is estimated that an aggregate of 250,000 tons of pig iron is piled in the yards of 12 or 13 pig iron producers in the Pittsburgh and Youngstown districts. Nothwithstanding this fact, the Valley Mold & Iron Corp. expects shortly to blow in its Alice furnace on basic.

The pig iron averages for June compiled by W. P. Snyder & Co., were $28.50, valley for bessemer compared with $30.10 in May and $31 in April, and for basic $26.51 compared with $28.056 in May and $31 in April.

Buying Dull; Inquiry Improved

Boston, July 3.—Considerable improvement in inquiry for pig iron is apparent, but buying is not expected to develop until after July 4. Prices continue to decline. Stocks are low in many quarters, and at least moderate buying for the third quarter is due at any time. One foundry is in the market for 500 tons of No. 2X iron (2.25 to 2.75 silicon) and 150 tons of No. 1X iron (2.75 to 3.25 silicon). Another foundry is asking for 200 tons of iron. A New Hampshire foundry is reported about to close for 300 tons. Other inquiries, mostly for 100 and 200-ton lots, bring the total now in hand by principal dealers close to 2000 tons. Buffalo and Pennsylvania furnaces have made further price concessions during the past week. Several recent sales of Buffalo iron have been made at $28, furnace, for No. 2X iron, (2.25 to 2.75 silicon), or $32.92, delivered. A central Pennsylvania furnace sold 200 tons of No. 2X iron at a delivered price of approximately $32.50. Eastern Pennsylvania furnaces have dropped from $29, base, to $28.50, base. In some cases as low as $28 is quoted from that district, which with the $3.65 freight rate, is equivalent to $31.65, delivered. No sales at this low figure have been confirmed. However, several sales have been made at $32.15, delivered. Other sales of the week bring the total to about 1000 tons, but carload lots have been the rule. One of the largest consumers in the district is inquiring for prices without any tonnage mentioned. A close observer reports that foundries generally are unusually low on pig iron stocks.

Inquiry Is Improved

New York, July 3.—Sales of pig iron in this district continue small although the total for the past week is somewhat larger than the preceding week and probably aggregated close to 5000 tons. New inquiries are coming out in better volume, and aggregate at least 6000 tons. There is a disposition, however, to feel out the market so that there is no assurance as to just how much of this tonnage will be placed at this time. The largest current inquiry is from an air brake manufacturer which wants 2000 to 3000 tons of foundry for shipment beginning immediately and extending over the third quarter. A New York state coupler manufacturer is inquiring for several thousand tons of basic for July shipment. The Ingersoll Rand Co. is in the market for some tonnage for Painted Post, N. Y. Another New York state melter is in the market for 1000 tons, mainly for the third quarter and extending into the fourth quarter. A Connecticut melter is expected to buy about 1000 tons of high silicon iron for third quarter.

Prices continue to decline. Eastern Pennsylvania foundry iron now may be had without difficulty at $28, base furnace, plus $1 silicon differentials. Buffalo foundry iron generally is quoted at $28 base furnace plus silicon differentials but attractive orders could be placed at less than this price. The central Pennsylvania foundry market generally is quoted at $27 to $27.50 base furnace.

Buffalo Inquiry Is Heavier

Buffalo, July 3—Furnacemen here report more activity among the consumers in the way of buying interest. Inquiry for the week totaled 7500 to 8000 tons including one inquiry for 2500 tons of foundry. Another inquiry was for 3000 tons of malleable, but it is understood decision was made not to buy. Neither tonnage has yet been placed. The going price for No. 2 plain (1.75 to 2.25 silicon) is $28. One local furnace, which it had hitherto been believed had little or no capacity for third quarter, is believed to be a leader in the lower price movement.

Lower Prices Named

Cleveland, July 3.—Pig iron prices continue to soften, and while melters are showing more interest in the low offers made by some producers comparatively few of them are buying. The market has the appearance of more activity as users put out inquiries to develop still lower prices, the aggregate of this general class of inquiry coming to one merchant in the week, from various points, amounting to 15,000 to 20,000 tons. Some of these are the basis of present negotiations, which it is believed will develop more attractive quotations. Certain sellers are frank to say that in their opinion the market will go as low as $25, valley, before business is done in sufficient volume to produce a reaction. Sales of pig iron are being made by one large merchant interest on the basis of $26.50, valley, and $27, Ironton. The Buffalo price is $28. Sales in the week, some of which were closed at the foregoing figures, totaled 9000 to 10,000 tons. In this aggregate there were five individual sales of 1000-ton lots, the others being of smaller amount. Another interest represented in the northern Ohio group has sold two lots of foundry iron to Cleveland melters for immediate delivery at $28, Cleveland furnace, this being $1 less than previously offered

by a local seller. The delivered price on the two lots was $28.50, as compared with a delivered price of $28,27, on the basis of iron at $26.50, valley furnace. The Westinghouse Electric & Mfg. Co., one of the purchasers, also is understood to have closed for a moderate sized tonnage for Pittsburgh. The two sales in Cleveland totaled around 1000 tons. A lake furnace has been offered 3000 tons of foundry iron for the last half by an Indiana melter at $26.50, lake furnace, but has rejected the offer. A stronger situation is noted in the market just west of Cleveland. A stack in the Detroit territory is holding for $29. A malleable castings company is reported to have closed elsewhere for 1500 tons of malleable and 3000 tons of basic, on which local interests figured. No further sales of basic have been closed, and the price is indefinite. A valley maker is said to be willing to take on a good tonnage as low as $25, furnace. A Batavia, N. Y., foundry is inquiring for 900 tons of iron, and the American Car & Foundry Co. for 1200 tons.

Buying Mostly for Spot

Cincinnati, July 3.—The demand for pig iron for prompt shipment continues active, with more inquiry and actual purchasing for third quarter. On the whole, however, business booked beyond this month is in relatively light volume, for the principal reason that consumers still cling to the opinion that prices have not reached the bottom of their downward movement. Sellers report that were it not for the spot buying movement the market would be quiet, because inquiry for third quarter iron is not developing into orders as rapidly as the trade anticipated. The southern market is firm at $27, Birmingham base, although two furnaces are offering iron for third quarter delivery at $25, base. It is expected that these producers will restore the $27 level as soon as a buying movement gets underway. Northern iron is lower with sales as low as $27, Ironton base. One sale of 1000 tons on this basis was closed. The market range is $27 to $27.50.

Sales during the past week include 600 tons of southern iron to a Hamilton, O. consumer, who also closed for a like tonnage of the northern foundry grades. The National Malleable Castings Co., Cleveland, is reported to have bought 1500 tons of malleable for its Indianapolis plant and 2000 tons of basic for Sharon, Pa. A sale of 2000 tons of malleable to a northern Indiana melter for July and August shipment, also is noted. A central Ohio consumer also bought 300 tons of malleable for prompt delivery. Inquiries at hand involve about 4000 tons of malleable for third quarter. The Louisville and Nashville railroad is inquiring for 1000 tons for third quarter delivery. The inquiry specifies a certain tonnage of southern, northern and charcoal iron.

Consumers Await Concessions

Birmingham, Ala., July 2.—The pig iron market in the Birmingham district continues slow, consumers waiting for concessions. The small interest which went in the market about the middle of June with a few thousand tons of iron on a basis of $25, following the sale

(*Continued on Page* 4)

More Furnace Coke Sold

Contracts Closed at $4.75 to $5—Foundries Covering Third Quarter Requirements at $6 to $6.50

COKE PRICES, PAGE 5

Pittsburgh, July 3.—One by one negotiations for beehive furnace coke are being closed by blast furnace interests, and contracts for third quarter have developed numerous quotations of $5 and several at $4.75. Prices of $4.75 to $5 now represent the contract market spread. At least two blast furnace interests have closed below the $5 level, one for slightly in excess of 10,000 tons monthly for the third quarter and the other for a smaller tonnage. The interest last referred to, a valley merchant furnace, continues to buy three or four carloads of furnace coke at a time in the spot market as $4.50 quotations become available. Among those still negotiating for coke requirements is the Valley Mold & Iron Corp., which intends to blow in its Alice furnace. On its requirements $4.75 has been quoted. Spot market deals are somewhat fewer in number and $4.50 to $4.75 are the going levels now encountered. The drop in the contract market doubtless will be followed by further revisions of contracts placed some time ago at higher levels. Some of the buyers which closed at $6 already are entering upon negotiations with that end in view. New demands exist for heating coke and practically no inquiries are current from abroad. Some coke producers are endeavoring to collect fair sized backlogs of business for next fall and winter from the various gas companies suggesting to them that they buy furnace coke as a substitute for anthracite coal. A fairly large number of foundries and other foundry coke users have contracted for the third quarter, some entering into arrangements for the remainder of the year. One producer has advanced his price 25 cents to $6.75, ovens. From $6 to $6.50 represents the usual contract market with one interest still claiming to obtain $7 and higher. Prices as low as $5.25 to $6 are being obtained in the spot market, hence the spread today is $5.25 to $6.75. The weakness in the foundry coke spot market is attributed to a large number of ovens being placed on a four-day per week schedule. It is understood that in some directions among smaller operators wage adjustments to harmonize more closely with selling prices are being worked out. Large operators continue to pay the high scales since they cannot afford to run any risk of labor disturbance. Production, according to the *Connellsville Courier*, for the week ended June 23 was 306,720 tons as compared with 302,400 tons the preceding week.

By-Products Foundry Coke Lower

New York, July 3.—The Seaboard By-Product Coke Co., Seaboard, N. J., has reduced its price on by-product foundry coke by 50 cents a ton effective July 1. The new price level is $11.41 to $11.34, delivered at Newark and other northern New Jersey points. It is difficult to buy even coke of the poorer qualities at $5.50, Connellsville. The market on standard foundry coke for spot shipment may be quoted at $5.75 to $6.25, with special brands occasionally at $7.

Southern Output Holding Up

Birmingham, Ala., July 2.—Demand is present for all the coke being manufactured in the South and production is holding up. Beehive and by-product coke is wanted. Quotations still range between $8 and $8.50 per ton, with $9 asked for small lots.

Buying in Small Lots

Cincinnati, July 3.—Activity in the coke market is confined to buying in small lots for prompt shipment. A public utility at Richmond, Va., is inquiring for 2000 tons of furnace coke for shipment during the next 30 days. The inquirer also requests prices on 5000 tons of furnace coke for third quarter and 20,000 tons of the same grade for delivery during the next 12 months. The Louisville & Nashville railroad is negotiating for 400 tons of foundry coke for shipment during this quarter, while another inquiry has been received for 100 tons of New River foundry coke for last half shipment. Prices are unchanged, although the spread on New River foundry coke has been widened 50 cents, making quotations $12 to $13, ovens. The by-product situation is firm. The Eaton Rhodes Co., is offering Ashland Solvay by-product coke at $9 Conifellsville base, for July shipment. Sales of Wise county foundry coke have been made here at $7.50 ovens.

Connellsville Coke Easier

Philadelphia, July 3.—Furnace coke is easier. Standard furnace grades for shipment over one to three months are $5, Connellsville. Spot furnace fuel is $4.50 to $5. Spot foundry coke is $5.75 to $7, Connellsville, depending on the brand.

New England Price Lower

Boston, July 3.—The New England Coal & Coke Co. has reduced its price on by-product coke from $14 to $13.50 while the producer at Providence, R. I., still holds to 14. Connellsville beehive coke is down to $11.55, delivered from $12.

Melters Well Covered

St. Louis, July 3.—Contracting for coke is proceeding slowly, the total volume during the final week in May being the smallest of any week in the month. According to dealers melters are well covered, and most of them have fuel in their yards to carry them for some time. A small tonnage on consignment was purchased by a local melter on a basis of $4.50, Connellsville. Industrial coke users covered their requirements in the recent buying movement, and the demand from that source is considerably slower than heretofore. An Iowa utilities company is inquiring for approximately 600 tons for delivery through September.

Pig Iron Prices Lower

(*Concluded from page 3*)

of some 5000 to 6000 tons by a Tennessee producer at $25.50, did not bring about a break in the Alabama market. The larger and more active producers are maintaining their price at $27. Purchasing is in small lots. The offer of iron at $25 did not inspire a quick response from buyers. The furnace interest which has made the cut in price is also a melter. Surplus iron on yards is below 20,000 tons, exclusive of basic.

Chicago Price Down to $29

Chicago, July 3.—A further decline of $1 brings the northern pig iron price to $29, Chicago, without stimulating buying. The third quarter opens with the bulk of the tonnage closed for July delivery, little being sold for the remainder of the quarter. Producers are secured for 30 days with present bookings. Competition in other centers, south and east, has weakened the situation and brought a decline of $3 from the price long held. Selling in June was much in excess of that in May, though there has been no definite covering movement. Some spot carloads recently were closed at $30, Chicago. Sales of 1000 tons of basic for shipment to an Illinois user and 500 tons of foundry iron to a Wisconsin melter for third or fourth quarter delivery are noted. Inquiry includes 1000 tons of foundry iron for a Wisconsin user for third quarter; 900 tons of foundry iron for an Illinois melter, for the third quarter; 200 tons of foundry for a Wisconsin buyer for July and 500 tons of foundry for a Chicago user for July. Lake Superior charcoal iron is inactive and nominally unchanged in price. Low phosphorus is selling in small lots at $38, delivered. Silveries are quiet. The sale of 600 tons to a Michigan user for July delivery under the schedule is noted.

Slight Improvement Noted

Philadelphia, July 3.—Pig iron buying is improved somewhat over that of a week ago. However, consumers generally refrain from buying any more than is necessary. The market has sagged off further during the past week. Eastern Pennsylvania and New Jersey foundry iron now generally are quoted $28, base furnace, plus $1 silicon differentials. At the same time sales have been made at $27.50, base and some at $28.50, base. The biggest purchase noted was made by the J. L. Mott Co., Trenton, N. J., which took a substantial tonnage of foreign iron. Gray forge iron now is nominal at $28 to $28.50, delivered eastern Pennsylvania. Malleable is nominal at $28.50 to $29.50, eastern furnace. Basic is unchanged and is entirely nominal in view of the lack of business. Several hundred tons of copper-free low phosphorus iron was sold at the equivalent of $34.79 delivered Philadelphia. Copper-bearing iron continues quoted $33 furnace, while Virginia foundry now is $27, base furnace, plus 50 cents silicon differentials, and central Pennsylvania foundry $27 base furnace, plus 50 cents silicon differentials. The No. 1 Temple, Pa., furnace was blown in this week.

Market Remains Backward

St. Louis, July 2.—Developments in the pig iron market during the closing week of June were entirely negative. Actual sales included only scattered, small prompt lots, with the aggregate hardly exceeding 600 tons. Inquiry was also considerably less active than heretofore. The price trend was downward. Certain Alabama and Tennessee furnaces have continued to offer at $25 and it was reported that figure could be done in the valley. Northern iron in volume can be had at $30, and a small tonnage was purchased by a local melter on a basis of $28 Chicago. Some resale tonnage, mainly southern grades, is appearing but not in quantity sufficient to disturb the market. In spite of these apparently inauspicious conditions, sellers are cheerful.

While there has been some slowdown in the immediate past in activities at the gray iron foundries and with specialty makers, the steel plants are maintaining their recent pace. Stove foundries in this district will close about July 4 for repairs and remain down two to three weeks.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	July 3, 1923	June 1923	April 1923	July 1922
PIG IRON				
Bessemer, valley, del. Pitts....	$28 77	30.27	32.77	26.76
Basic, valley	25.50	27.35	31.00	26.76
*No. 2 foundry, del. Pittsburgh..	28.27	29.52	32.77	26.16
*No. 2 foundry, Chicago.....	31.00	31.50	32.50	24.65
Lake Superior charcoal, Chicago	**36.65**	36.65	36.55	31.65
Malleable, valley	26.00	28.25	31.00	25.00
Malleable, Chicago	31.00	31.50	32.50	24.65
*Southern No. 2, Birmingham..	25.00	26.75	27.00	18.50
*Southern Ohio, No. 2, Ironton..	27.00	28.25	31.00	24.15
Basic eastern del., eastern Pa..	**28.14**	28.14	30.75	26.00
**No. 2X, Virginia furnace ...	27.50	28.00	29.25	26.00
**No. 2X, Eastern del., Phila..	29.76	30.60	32.76	27.90
Gray forge, val. del. Pittsburgh	27.77	29.02	31.77	25.76
Ferromanganese, del. Pitts.....	129.79	124.79	124.79	72.29
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	42.50	42.90	45.85	35.00
Sheet bars, open-hearth, Pitts....	42.50	42.90	45.85	35.00
Billets, bessemer, Pittsburgh....	42.50	42.90	46.00	35.00
Billets, open-hearth, Pittsburgh..	42.50	42.90	46.00	35.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	**2.40**	2.40	2.35	1.70
Steel bars, Chicago	**2.50**	2.50	2.43	1.75
Steel bars, Philadelphia.....	2.72	2.745	2.825	2.025

	July 3, 1923	June 1923	April 1923	July 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.72	2.72	2.875	2.00
Iron bars, Chicago mills	2.50	2.60	2.60	1.80
Beams, Pittsburgh	**2.50**	2.50	2.45	1.70
Beams, Philadelphia	2.82	2.82	2.85	2.025
Beams, Chicago	**2.60**	2.60	2.53	1.75
Tank plates, Pittsburgh	**2.50**	2.50	2.45	1.70
Tank plates, Philadelphia	2.82	2.845	2.95	2.25
Tank plates, Chicago.....	**2.60**	2.60	2.55	1.75
Sheets, blk., No. 28, Pittsburgh.	3.85	3.85	3.85	3.15
Sheets, blue anl., No. 10, Pitts.	**3.00**	3.00	3.15	2.40
Sheets, galv., No. 28, Pittsburgh	**5.00**	5.00	5.00	4.15
Wire nails, Pittsburgh.....	3.00	3.00	3.00	2.40
COKE				
Connellsville furnace, ovens.....	4.50	4.65	6.25	10.65
Connellsville, foundry, ovens....	5.25	5.50	7.80	11.40
OLD MATERIAL				
Heavy melting steel, Pittsburgh	19.50	20.50	25.85	16.60
Heavy melting steel, eastern Pa.	18.00	18.65	23.50	15.00
Heavy melting steel, Chicago...	17.50	17.75	22.40	15.15
No. 1 wrought, eastern Pa....	21.50	22.75	27.00	18.25
No. 1 wrought, Chicago	16.75	16.95	22.75	15.20
Rails for rolling, Chicago	18.50	19.40	23.65	16.00

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago

July 3, 1923	June 27, 1923	June, 1923	April, 1923	July, 1922	July, 1913
$45.72	$46.16	$46.46	$47.01	$37.50	$26.34

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 74, WAREHOUSE PAGE 66, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 70

Pig Iron

Bessemer, valley	$27.00
Bessemer, Pittsburgh	28.77
Basic, valley	25.50
Basic, Pittsburgh	27.27
Basic, Buffalo	28.00
Basic, del., eastern Pa.	28.14 to 28.50
Malleable, valley	26.00 to 26.50
Malleable, Pittsburgh	27.77 to 28.27
Malleable, Chicago	31.00
Malleable, Buffalo	28.50 to 29.00
Malleable, del., eastern Pa.	29.75 to 30.75

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	30.76 to 31.13
No. 1X Buffalo	29.00
No. 2 foundry, valley	26.50 to 27.00
No. 2 foundry, Pittsburgh	28.27 to 28.77
No. 2 foundry, Buffalo	28.00 to 29.00
No. 2 foundry, Chicago	31.00
No. 2 foundry, Granite City	30.00 to 31.00
No. 2 foundry, Ironton fur.	28.00 to 29.00
No. 2 foundry, Cleveland del.	28.27 to 28.50
No. 2 foundry, del. Phila.	28.76 to 29.13
No. 2 foundry, N. J. tidewater	29.13 to 29.63
No. 2X, eastern del., Phila.	29.76 to 30.13
No. 2X, east. N. J., tidewater	30.13 to 30.63
No. 2X, eastern del. Boston	33.15 to 33.65
No. 2X foundry, Buffalo fur.	28.50 to 29.00
No. 2X, Buffalo, del. Boston	33.42 to 33.92
No. 2 southern, Birmingham	25.00 to 27.00
No. 2 southern, Cincinnati	29.05 to 31.05
No. 2 southern, Chicago	31.01 to 33.01
No. 2 southern, Philadelphia	31.80 to 33.80
No. 2 southern, Cleveland	31.01 to 33.01
No. 2 southern, Boston (rail and water)	31.91 to 33.91
No. 2 southern, St. Louis	30.17 to 32.17
No. 2X, Virginia furnace	27.50
No. 2X, Virginia, Phila.	32.77
No. 2X, Virginia, Jersey City	33.04
No. 2X, Virginia, Boston	33.42
Gray forge, eastern Pa.	28.00 to 28.50
Gray forge, val., del. Pitts.	27.77 to 28.27
Low phos., standard, valley	35.00
Low phos., standard, Phila.	34.79
Low phos., Lebanon furnace	33.00
Charcoal, Birmingham	34.00
Charcoal, Superior, Chicago	36.65

Silvery Iron

Jackson County, Ohio, furnace

8 to 9 per cent	$38.50
9 to 10 per cent	40.50
10 to 11 per cent	42.50
11 to 12 per cent	45.50
12 per cent	47.50
13 per cent	50.00

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	$47.50
11 to 12 per cent	50.80

Ferroalloys

Ferromanganese 78 to 82 per cent, domestic, seaboard or furnace	$120.00 to 125.00
Ferromanganese, delivered, Pittsburgh	124.79 to 129.79
†Ferromanganese, 79 per cent English c.i.f. seaboard	120.00 to 125.00
Spiegeleisen 19 to 21 per cent furnace or tidewater	45.00 to 47.50
Ferrosilicon, 50 per cent contract freight allowed	87.50 to 92.50
Ferrotungsten standard, per pound contained	95.00
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	nominal

†Duty paid.

Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$4.50 to 5.50
Connellsville foundry	5.25 to 6.25
New River furnace	9.50 to 10.00
New River foundry	12.00 to 13.00
Wise county furnace	6.25 to 6.75
Wise county foundry	7.50 to 8.00
Alabama furnace	7.50 to 8.00
Alabama foundry	8.00 to 9.00

By-Product

Foundry, Newark, N. J., del.	$11.34 to 11.41
Foundry, Chicago, ovens	13.50
Foundry, Boston, delivered	13.50
Foundry, Granite City, Ill.	14.00
Foundry, Alabama	8.00 to 9.00

Semifinished Material

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Open-hearth, Philadelphia	45.17 to 46.17
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50
Forging, Pittsburgh	47.50 to 52.50
Forging, Philadelphia	55.17 to 57.17

SHEET BARS

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50

SLABS

Pittsburgh	$42.50
Youngstown	42.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh $51.00 to 52.50

Standard extras, $2.50 per ton over ¼ inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.45c
Universal skelp, Pittsburgh	2.45c
Sheared skelp, Pittsburgh	2.45c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.50c to 2.60c
Structural shapes, Phila.	2.72c to 2.82c
Structural shapes, New York	2.74c to 2.84c
Structural shapes, Chicago	2.60c to 2.70c
Tank plates, Pittsburgh	2.50c to 2.60c
Tank plates, Philadelphia	2.82c to 2.92c
Tank plates, New York	2.84c to 2.94c
Tank plates, Chicago	2.60c to 2.80c
Bars, soft steel, Pittsburgh	2.40c to 2.50c
Bars, soft steel, Philadelphia	2.72c to 2.82c
Bars, soft steel, New York	2.74c to 2.84c
Bars, soft steel, Chicago	2.50c to 2.60c
Bars, refined iron, Pittsburgh	3.25c to 5.00c
Bars, rail steel, Chicago	2.30c
Reinforcing bars, Pittsburgh	2.30c to 2.40c
Bar iron, common, Phila.	2.72c to 2.82c
Bar iron, common, New York	2.74c to 2.84c
Bar iron, common, Chicago	2.50c to 2.60c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	3.15c to 3.30c
Hoops, Pittsburgh, small	3.50c
Bands, Pittsburgh	3.15c to 3.30c
Cold finished steel bars, Pittsburgh base	3.25c
Steel shafting, Pittsburgh	3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.61

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	30.00 to 39.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.75c
Spikes, boat and barge, Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	3.25c
Track bolts, Pittsburgh	4.00c to 5.50c
Track bolts, Pitts. Standard	4.00c
Track bolts, Pitts., small	5.00c to 5.50c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c to 2.75c
Tie plates, Chicago	2.60c

Spike, tie plate and track bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Wire nails, Pittsburgh	3.00c to 3.10c
Plain wire, Pittsburgh	2.75c to 3.00c
Annealed wire, Pittsburgh	2.90c to 3.20c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c to 3.60c
Barbed wire, painted, Pitts.	3.45c to 3.70c
Barber wire, galv., Pittsburgh	3.80c to 4.05c
Polished staples, Pittsburgh	3.45c to 3.65c
Galvanized staples, Pittsburgh	3.80c to 4.05c
Coated nails, count keg, Pitts.	2.70c to 2.75c
Woven wire fencing (retailers)	.65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburgh stamping quality	3.30c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	5.00c to 5.25c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	4.07c to 4.17c
No. 28, open-hearth, Chicago	4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, open-hearth, Chicago	3.84c to 4.34c

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c
No. 28 bessemer, Pittsburgh	5.00c
No. 28, open-hearth, Phila.	5.32c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c to 3.25c
No. 10, bessemer, Pittsburgh	3.00c to 3.25c
No. 10, open-hearth, Phila.	3.32c to 3.57c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts. $5.50 to $6.00

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	61 to 62	49½ to 50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	61.20 to 63.20
Six-inch and over, Chicago	57.20 to 59.20
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	63.60 to 65.50
Six-inch and over, New York	59.00 to 60.00
Three-inch, Birmingham	59.00 to 60.00

Class A pipe is $5 higher than Class B.

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4 inch, plus $20; 3 inch, plus $20; gas pipe fittings, $5 higher.

Scrap Still Is Falling

Prices Continue To Decline as Consumer Buying Remains Exceedingly Light—Consumption Is Heavy and Stocks Are Low

SCRAP PRICES, PAGE 74

Chicago, July 3.—Nothing has happened to relieve the dullness in iron and steel scrap here, although the decline has been checked and prices appear to have reached a temporary level. A sign that possibly the bottom is near is found in the fact prices realized by railroads on their offerings are considerably higher than were possible two weeks ago. General users are not interested, probably due in part to the holiday. A consumer of steel is willing to take on further tonnage at $17.50 per gross ton. Railroad offerings continue heavy and this has a tendency to keep the market down. The Chicago & Northwestern railroad offer 2300 tons, the Pittsburgh & Lake Erie railroad 1800 tons, the Pennsylvaia railroad, eastern region, 28,000 tons, and the Pennsylvania railroad, southwestern region, 7000 tons.

Railroads Sell Heavy Tonnage

Boston, July 3.—Except for sales of accumulated scrap by railroads and other producers, trading in nearly all grades has been quiet. The Boston & Maine railroad sold nearly 30 cars of scrap rails and the General Electric Co. from 20 to 25 cars of miscellaneous scrap, mostly machine shop turnings. Other heavy sales are pending. The Maine Central has published a long scrap list. The Boston Elevated railway is receiving bids on several thousand tons, one item being 1000 tons of steel girder rails. Heavy melting steel is down to $14 without any real consuming demand. The Boston Consolidated Gas Co. is understood to have taken 500 tons of chemical borings recently, but the price is not available. Recent small orders of chemical borings are known to have been placed at $14.60 shipping point. Machine shop turnings in the General Electric Co. sales sold to a local dealer at $11.60 per gross ton f.o.b. cars. All cast grades are down. No. 1 machinery has sold at $23 delivered and a good grade of textile scrap at $23.50.

More Interest Is Shown

Buffalo, July 3.—More interest is apparent in the market for scrap iron and steel and dealers believe buying now will be only a matter of a week. Two large mills are displaying added interest in the market and action on the part of these buyers is expected any day. No buying of note has taken place for several weeks and prices are nominal. Dealers believe consumers of heavy melting steel will not be able to secure a tonnag under $22.

Prices Still Declining

New York, July 3.—Further price reductions are reported in the local scrap market. Heavy melting steel and No. 1 railroad steel again have been marked down 50 cents, and similar reductions have been made in grate bars, railroad wrought, cast iron borings, and mixed borings and turnings. Shafting has been marked down $1, now holding at a range of $20.50 to $21, New York. The decline in heavy melting steel and No. 1 railroad steel follows a reduction in the offering price of the leading eastern Pennsylvania consumer, which is paying $17, delivered Bethlehem, for the latter grade. Among the few grades unchanged are wrought pipe, stove plate and heavy and machinery cast. Demand for virtually all grades continues listless, with no marked improvement expected in the near future.

Lower Prices Are Quoted

Philadelphia, July 3.—Such transactions as have been done in the local iron and steel scrap market during the past week have been at lower prices. On the whole the market is weaker and demand small. Consumers generally continue out of the market due to the fact that on account of the falling prices each purchase recently made, soon has looked like a poor one. However, it is expected considerable buying will be done as soon as the price bottom has been reached as stocks are low.

Consumer Buying Lacking

Pittsburgh, July 3.—For the most part consumer buying of scrap continues absent, the only active buyer being the Midland, Pa., consumer which closed on an aggregate of 7000 tons or more, but dealers are not worried. They are showing considerable faith in the future and yard stocks are being increased wherever possible at permissible figures. Prices accordingly show continued weakness, practically every grade

(*Concluded on Page 20*)

Dull Market

Continues To Prevail in Ferroalloys—Heavier Buying Is Expected

Pittsburgh, July 3.—Continued dullness pervades the ferroalloys market. Interest even in small lots of ferromanganese is limited although producers as well as many middle interests alike look for extensive buying for the fourth quarter during July and August. Among those expected to come into the market are the Jones & Laughlin Steel Corp., unless it starts one of its own furnaces on the production of ferromanganese; the United Alloy Steel Corp., the American Steel Foundries, and other consumers. At present the market is quoted at $125, seaboard base, for all delivery positions whether prompt or future, which is $129.79 delivered Pittsburgh common points.

Interest in spiegeleisen has not as yet developed in connection with large amounts. Occasionally a 50 or 100-ton lot is asked for for filling-in purposes. One large producer's prices are unchanged on the basis of $45 to $47.50 furnace, for the 19 to 21 per cent grade, the 16 to 19 per cent grade being quoted at $1 per ton lower. Prices are made according to tonnage wanted. Another producer is quoting $50 f.o.b. furnace, and because its shipping point is nearer Pittsburgh, it is able to compete on that basis on small lots. It will, however, name $45 furnace, on tonnage.

Demand for ferrosilicon, ferrovanadium, ferrotungsten, and in fact for all other alloys has diminished to practically a vanishing point. Some ferrotungsten possibly would be bought if prices around 90 cents were available but the market here is quotable at 92½ to 95 cents. The 50 per cent grade of ferrosilicon is offered at $90, freight allowed, but no interest among consumers is manifested.

Carload Sales the Rule

New York, July 3.—Additional carload sales of English ferromanganese have been made during the past week by first hand at $125, duty paid tidewater. Despite talk of resale offers at lower prices, no business in resale ferromanganese is reported here.

Several hundred tons of domestic spiegeleisen have been sold during the past week at current prices which continue on the basis of $45 furnace for 20 per cent metal in lots of 100 tons and over, and $47 to $47.50 for smaller lots.

Some Resale Lots Placed

Chicago, July 3.—Ferroalloys are in small demand. Two carloads of resale metal have been sold at a price shading $125 seaboard or furnace. Spiegeleisen is quiet and unchanged at $45 furnace.

Tin Plate Users

Continue To File Heavy Specifications—New Buying Limited

Pittsburgh, July 3.—Specifications on tin plate contracts continue to assume large proportions, most can makers being anxious to receive all of the material due them as soon as possible. New forward buying has been limited, due to the fact practically all consumers are protected on tonnage. The Texas Co., however, is understood to have placed recently with an independent West Virginia tin plate producer an order for 75,000 base boxes for oil can purposes. For the most part, however, both customers and shippers alike are concerned about the discharge of present mill obligations. It is thought probable that this filled-up order book will continue for some time to come since tin plate consumption this year will doubtless be larger than any other in history. At the moment, the major portion of attention is being paid to vegetable containers. Fruit containers will follow shortly and other general-line cans at all times furnish a sizable outlet for tin plate tonnage. The general price is unchanged at $5.50 per base box, 100 pounds, Pittsburgh, although in one or two directions independents claim still to be receiving $6 on certain lots.

Strip Output Slumps

Pittsburgh, July 3.—Hot and cold-rolled strip steel output will suffer some curtailment during the present week owing to the slowing down of mill operation to make repairs, etc. While there is a tendency among consumers to withhold future buying, it is solely because de-

liveries are dated so far ahead which means that practically all consumers are well covered and have much tonnage coming to them on old orders. Against these, specifications are received regularly and these are unaccompanied by cancellations, and except in a few unimportant cases suspensions are absent. The American Steel & Wire Co.'s price on cold strips continues 5.00c base Pittsburgh, but the independents are fairly firm on a 5.25c level. The going market on hot strips is 3.30c, base Pittsburgh, although on some rim stock and material for cold rollers who have no hot mills, 3.15c has applied. In fact, down to 3.00c base Pittsburgh, has been done owing to the fact material for the cold rollers is uncropped, unbanded and shipped in gondola cars so that the difference in cost of preparation is sufficiently large to permit of the acceptance of the lower figure since the material is taken as it comes from the hot mills.

To Sell Surplus Shells

Washington, July 3.—More than 2500 tons of steel is included in surplus shrapnel shells, British type, upon which sealed bids will be opened on July 31 at the Frankford arsenal, Philadelphia. Of the 60-pound shells, 153,205 pieces are being offered, each containing 29 pounds of steel, 20 pounds of lead balls, and some brass, copper and tin. Forty-five hundred pieces of 6-inch shrapnel, containing 62 pounds of steel, 26 pounds of lead balls, 2 pounds of copper bands and some tin, also are offered.

Establishes Offices

The Mill & Foundry Supply Co., recently organized to promote the sale of molybdenum as an alloy for rolls and steel castings, has established offices at 1214 Bessemer Bldg., Pittsburgh. Officials of the company include C. F. Blue Jr., formerly president of the Carbon Steel Co.; G. O. Loeffler, who for over 30 years was chemist and metallurgist for the Carbon Steel Co.; and R. C. Purkhiser, formerly with the Carbon Steel Co. but now associated with the Pittsburgh Iron & Steel Foundry, a subsidiary of Mackintosh-Hemphill Co., Pittsburgh.

Specify Tariff Ruling

Washington, July 3.—The customs division of the treasury department has made a ruling to the collector of customs at Portland, Me., to the effect that limestone for use in steelmaking, road building and concrete work is covered by paragraph 203 of the Fordney-McCumber act, specifying a duty of 5 cents per 100 pounds, while pulverized limestone for fertilizer is free under paragraph 1583 of the act.

Named Sales Agents

Pilling & Co. have been appointed exclusive eastern sales agents for the sale of Wrigley cold blast charcoal pig iron, produced at the Wrigley, Tenn., furnace of the Bon Air Coal & Iron Corp., Nashville, Tenn. The appointment is effective July 1.

Semifinished Sales Lag

Consumers Well Covered for Their Third Quarter Requirements—Mill Operations Easing Off—Sheet Bar Price $42.50

SEMIFINISHED STEEL PRICES, PAGE 5

Pittsburgh, July 3.—Offerings of semifinished material have greatly increased due to the fact that so many mills have excess raw material to throw on the market during the time they are idle for repairs. This is particularly true of sheet bars. No widespread price weakness has developed, however, although $42.50, Pittsburgh or Youngstown, is the quotable market price on sheet bars, billets and slabs as developed over the last two weeks and as reported in IRON TRADE REVIEW. During a period like the present when offerings of tonnage are freely made, there is a total disappearance of inquiries; the seller seek the buyer. Forging billets are quotably unchanged at $47.50 to $52.50, but when specified deliveries are named the prices usually are $50 to $52.50, Pittsburgh.

Wire rods are quoted at $51 to $52.50, Pittsburgh, for the common soft grade, No. 5 to ¼-inch. One or two of the wire mills are unable to accept more business in wire rods for delivery over the third quarter, needing all excess production in their own wire finishing departments. From time to time inquiries develop involving up to 500 tons at a time and room is occasionally found for them among the other producers. Universal, sheared or grooved skelp is unchanged at 2.45c, base Pittsburgh. The price is somewhat nominal owing to a lack of demand. Practically all users have large quantities on hand or coming to them on order; hence no interest is manifest in forward buying. Conversion mills find it difficult to accumulate a sufficiently large working force to keep pace with their order books and incoming skelp. Hence all have large stocks and offerings of skelp tonnage by producers develop no interest.

Some Inquiries Received

Cleveland, July 3.—Some inquiries have been received here in the week for sheet bars and billets from points in the East and West, but the leading maker in this territory is not quoting, being sold up for all of the third quarter. Recent sales of sheet bars, billets and slabs in this district established the price of $42.50, since which the market has not recently been tested.

Moderate Sales Closed

Philadelphia, July 3.—Further moderate sales of billets were made in the past week in this district. Forging billets are $55.17 to $57.17 delivered at Philadelphia. Reroller billets are $45.17 to $46.17, delivered at Philadelphia. Last week's quotations in IRON TRADE REVIEW were incorrect. They were on an eastern mill basis, instead of a Philadelphia delivered basis, as represented. Wire rods continue to sell at $51, Pittsburgh.

Less Interest in Market

Youngstown, O., July 3.—Consumers of sheet bars are well covered for their third quarter requirements, producers are discharging their obligations according to schedule and with the suspension of various sheet mills for a period of a week or more, this explains the lack of interest in the semi-finished market at present. The price of $42.50, Youngstown, now is applying on July shipments of slabs, billets and sheet bars and will continue to be the market on semifinished for the remainder of the third quarter. While forging billets are not to be had in this district at present the market price of this commodity is considered to be $47.50, Pittsburgh.

To Build Automobiles

The R. H. Long Co. has sold its shoe factory in Worcester, Mass., valued at $870,000 to the R. H. Long Motor Co. and will abandon the making of shoes. The latter firm will devote the entire building to the building of automobiles. Mr. Long is a builder of machinery in Framingham, Mass., where the automobiles have been built up to the present time.

To Build Machinery

Manufacture of refrigerating machinery is the purpose of the newly organized Frankenburg Refrigerating Machinery Co. of Milwaukee, which has been incorporated in Wisconsin with $50,000 capital stock by Bernard V. Brady, A. G. Bouchard and G. A. Gessnert, all of whom are attorneys at 1103 Railway Exchange building, Milwaukee. The names of the interests behind the new enterprise have not been divulged.

Construction Firm Formed

The Shea-Whelpley Construction Co., Cleveland, has been organized with offices at 407 National building, specializing in blast furnace, open-hearth, and rolling mill masonry construction. P. C. Shea, formerly vice president and active manager of the P. J. Brown Construction Co., Cleveland, and E. G. Whelpley, formerly general superintendent for that company, are organizers of the new company.

Fire Damages Plant

Birmingham, Ala., July 2.—Fire recently damaged a part of the plant of the Connors Steel Co., manufacturer of steel hoops, bands and cotton ties putting out of service a considerable portion of the works. The season on cotton ties has just opened up and shipments have been going steadily from the plant. Much stock on hand was not touched by the fire. George Connors, president of the company, estimates the loss at $200,000. The burned portion will be rebuilt.

New Bar Extras Named

Some Sizes Advanced $2 to $10 Per Ton—Current Demand Is Only Fair but Specifications Continue Heavy

BAR PRICES, PAGE 5

Philadelphia, July 3.—Steel bar demand is quieter although specifications against contracts continue heavy at the usual price of 2.40c, Pittsburgh or 2.72c, delivered Philadelphia. This is the minimum. Practically all makers this week are expected to issue a new card of extras which will show increases of from $2 to $10 per ton in a number of sizes of bars as compared with present cards. These new extras will become effective as to shipments immediately upon publication. The new card represents a studied effort to correct inconsistencies in the list now in effect and to harmonize the various extras with manufacturing costs now prevailing. The present card was adopted May 22, 1918 and has been revised only slightly since.

Cannot Lower 2.40c Price

Pittsburgh, July 3.—Various buyers of merchant steel bars report inability to obtain lower than 2.40c, base Pittsburgh, and that represents the going market both as regards the Carnegie Steel Co. and independent producers. One buyer the past week shopped around with 800 tons of highly attractive specifications and finally placed the order with an independent interest at the 2.40c figure. Deliveries for the most part are deferred from eight to 12 weeks although one or two mills still are quoting August deliveries and some can find room for rollings of certain sizes late in July or early in August. A condition which is considered healthy by producers is encountered in that buyers are taking everything on their orders and apparently the material is going into immediate use. Shipments are heavy since the car supply remains good. The refined iron bar situation is unchanged. Demand for the past several weeks has improved and prices still run from 3.25c to 5.00c, base Pittsburgh, depending upon the degree of refinement wanted or specified.

Steel Demand Still Insistent

Chicago, July 3.—While inquiry for new tonnage of finished steel is less than earlier in the year and mills are producing at a heavier rate, which has improved deliveries somewhat, consumers are not satisfied and are pressing as strongly as ever for prompt shipment. At present more steel is being produced and forwarded than is being booked. However, a tremendous tonnage of material remains to be bought and this undoubtedly will be placed before mills are able to bring their deliveries down to a reasonable period. Soft steel bars are available at Chicago for indefinite delivery at 2.50c, Chicago mill, while some tonnage for late third or fourth quarter delivery might be placed at 2.60c, Chicago mill. Specifications against contracts are being filed in full and no suspensions or cancellations are being met. Consumers apparently need all the material they can obtain for their current needs. Rail steel bars are still in good demand and mills producing this material are busy. They are steady at 2.30c, mill.

With bar iron mills generally closed for one to two weeks for repairs and inventory, production will be much less this month and mill backlogs probably increased considerably. Sales have not been heavy recently and demand is appreciably less, though not more than usual in the midsummer period. Prices are unchanged and 2.50c, Chicago mill, can be done, though the former quotation of 2.60c, Chicago, has not entirely disappeared.

Suspensions Are Exceptional

Cleveland, July 3.—While some suspensions of tonnage of steel bars on order have been received in this district and in one case at least involved a considerable quantity, such instances are so rare as to occasion surprise. Invariably consumers are taking their deliveries up to the full amount on order and show no signs of reduced consumption. While shipments are coming from the mills more freely and the situation is less tense in this regard than it was some weeks back, deliveries are moving up slowly. Some mills continue to be able to make shipments in a few weeks as they have been for some time but others, and these include the largest makers, will promise nothing under several months. Prices are steady at 2.40c, Pittsburgh, and reports of shading are practically absent. Inquiry for steel bars is improving and new business shows a moderate expansion.

Cold-Drawn Condition Healthy

Pittsburgh, July 3.—Healthy conditions prevail in the cold-drawn steel bar market. This reflects the condition of the past six or seven weeks. Customers are not speculating with tonnage but maintain a steady buying movement. This comes from diversified lines of consumption over a widespread area. New orders are not up to production, representing perhaps no higher than 75 per cent of output, but this causes no worry since back orders still are heavy and specifications against these are coming in regularly. No cancellations are noted and only in minor cases are suspensions received. Practically all producers are carrying over tonnage into the third quarter which customers wanted shipped during the second quarter period. Operations are on the basis of 100 per cent of ability to operate; this means that labor still is short and the general average operation is probably no higher than 80 per cent of capacity. The price of cold-drawn bars is unchanged at 3.25c, base Pitsburgh.

Seeking Hoop Shipments

HOOP PRICES, PAGE 5

Pittsburgh, July 3.—Hoop and band buyers are asking that material on order be shipped out before they continue the placing of additional orders. This is because the mills are well obligated for the entire third quarter and there is a lack of interest among consumers in buying beyond that period. Specifications against these orders are liberal and no cancellations or sizable suspensions are being received. Prices are unchanged on the basis of 3.15c to 3.30c, base Pittsburgh.

Some Bolt Makers Are Heavily Obligated

NUT AND BOLT PRICES, PAGE 70

Pittsburg, July 3.—On certain sizes of nuts and bolts some mills are obligated into, and beyond, the third quarter. Others can offer much better deliveries and recent new orders, which generally have been of small dimensions, have gone in the direction from which the prompt deliveries can be secured. Some of these mills not so well fixed with tonnage backlogs are offering something in the way of price concessions although quoted discounts are considered fairly representative of the majority of third quarter contracts booked, namely, on the basis of 50 and 10 off for large machine bolts. Numerous contracts from jobbers lately have been closed as well as a few from different lines of industry. Rivets are somewhat weak on the basis of 3.25c and 3.35c, base Pittsburgh, for structural and boiler rivets, respectively. Prices of 3.15c to 3.20c, and 3.20c to 3.25c lately have been quoted on attractive tonnages of the two grades, respectively. These prices represent concessions of $1 to $2 per ton. Smaller rivets are quoted usually at 60 and 5 off although 60 and 10 per cent applies where the specification is particularly desirable.

Buying for Third Quarter

Cleveland, July 3.—Local producers of bolts and nuts report the market on a par with that of a week ago. Some third quarter contracting has been done although one large producer has not yet opened its books. It will do so, however, shortly. Current business is not large, but still is of fair proportions. Prices generally are firm at the quoted discounts.

The leading rivet maker here reports it is receiving a large volume of third quarter business at prices of 3.25c and 3.35c, Pittsburgh, for structural and boiler rivets respectively. These prices also are being quoted on spot business which is not large, but they are being shaded on desirable business.

Bolt Buying at Average

Chicago, July 3.—Third quarter bolt contracts are practically all closed and producers have average order books against which to work. Some spot buying is being done also, which assists in keeping business active. Most consumers are buying about their usual requirements and are conservative.

Imports More Varied

Philadelphia, July 3.—Imports received in this port during the week

ending June 30 were more varied than in some weeks past, being as follows: Iron ore, from Sweden, 7289 tons; from Tunis, 6550 tons; scrap iron, from Cuba, 1320 tons; chrome ore, from British India, 1500 tons; pig iron, from England, 2000 tons; manganese ore, from Brazil, 5000 tons, and bar iron, from Sweden, 1000 tons.

Blast Furnace Operation Practically Unchanged

Pitsburgh, July 3.—The Ella, Pa. furnace of the Reliance Coke & Furnace Co. is being blown out today but otherwise blast furnace operation remains unchanged. The Carnegie Steel Co. keeps 53 out of its 59 stacks active, the Jones & Laughlin Steel Corp. has all 12 blowing, and the Pittsburgh Steel Co. and the Pittsburgh Crucible Steel Co. each have their 2 stacks in blast. The National Tube Co. likewise is running 100 per cent of blast furnace capacity.

Steelmaking suffered somewhat last week, going to 85 or 87½ per cent on the average, but it is expected to rebound this week owing to cooler weather. During the recent hot spell certain open-hearth furnace operators receded to 75 per cent of capacity. Sheet mill operation fell off about 10 per cent from the same cause and while the American Sheet & Tin Plate Co. will probably maintain its present rate of operation in both sheets and tin plate, independent interests will show poor records during the present week and week to follow, so much capacity being rendered idle in order to make long-postponed repairs and for the purpose of overhauling. The general average for the sheet industry probably will not be much over 50 per cent.

Valley Sheet Mills Are Down for Repairs

Youngstown, O., July 3.—All hot sheet and tin mill departments throughout the Mahoning valley are idle this week for repairs. Practically all finishing departments will operate throughout the week with the exception of the Fourth. Plans of the Trumbull Steel Co. call for the resumption of its 7 open hearths and its strip mills July 5 and its sheet and tin mills next Monday. The sheet mills of the Falcon Steel Co. which suspended a week ago will resume July 9. Sheet mills at the plant of the Mahoning Valley Steel Co. and the Newton Steel Co. will be idle for two weeks. All bar and hot sheet mills of the Youngstown Sheet & Tube Co. are closed for the entire week; the company however, will operate its two bessemer converters and 22 open hearths until July 4 when these departments will go down for the remainder of the week. Operations at its pipe mills will be suspended Wednesday only. All departments of the Republic Iron & Steel Co. will be idle this week with the exception of its open hearths and 1 plate mill which will resume operations Thursday. The company banked its Hannah stack last week pending the resumption of its bessemer department. The sheet mill of the Sharon Steel Hoop Co. is idle this week.

Oil Tanks Taking Plates

Demand for Moderate Size Lots Continues To Come Out—Eastern Mills Catching Up on Orders—Price Still 2.50c.

PLATE PRICES, PAGE 5

Chicago, July 3.—Activity in the plate market results from renewed demand for oil storage tanks and considerable tonnage is being booked for this purpose. The Sinclair Oil Co. has placed five storage tanks of 80,000-barrel capacity with the Graver Corp., Chicago, and the Chicago Bridge & Iron Co. One tank builder at Chicago has placed 5400 tons of plates with a Chicago mill for fourth quarter and another is about to close for 500 tons of plates for the same period. These plates are being booked at 2.80c, Chicago mill, for that delivery. The Humphreys Pure Oil Co. has placed 20 tanks of 55,000-barrel capacity with the Youngstown Boiler & Tanks Works. The Phillips Petroleum Co. recently placed 30 tanks with the Mount-Cooper Bridge & Tank Works, Tulsa, Okla. The Cosden Oil Co. has placed 10 tanks of 55,000-barrel capacity with an eastern fabricator, and two with a builder in the West. Ten other tanks of the same size were to be placed with a builder today.

Price of 1.50c Firm

Cleveland, July 3.—The price of 1.50c minimum on plates continues to be freely held. A car builder seeking 1500 to 2000 tons this week was unable to shade this figure and the business is understood to have been placed with an eastern producer on this basis. New business in plates is not heavy but miscellaneous tonnage is considerable and is well maintained. Eastern mills are not able to make quite as prompt deliveries as recently on sheared plates and now quote five to seven weeks with 2.60c, mill, as their price for western shipment. Universal plates, however, can be obtained promptly. None of the projects for lake vessel construction now under consideration have developed definite action.

Demand Heavy and Widespread

Pittsburgh, July 3.—Miscellaneous demand for tank, car and other plate tonnages is unusually heavy and widespread at this time. Tonnages vary according to the job under construction and while the majority of inquiries involve less than 500 tons, occasionally lots come up for attention calling for 1000 to 3000 tons, and once in a while a large tonnage, such as 10,000 or 12,000 tons, develops. None of the buyers of these tonnages has been able to obtain a price lower than 2.50c, base Pittsburgh, which is the ruling market figure. One or two quotations of 2.60c have been revised to 2.50c. One lot of 3000 tons of car plates was placed in the past week at 2.50c, base Pittsburgh. Orders for third quarter tonnage lately have been accepted on the basis of 2.50c with the understanding that all tonnage due on second quarter contracts was to be specified before the quarter ended. The discharge of old obligations has been expedited. Tank plate inquiries are developing throughout the country, and each week tonnages for tank orders already booked are being closed by fabricators with the mills. One or two such lots involving 3000 to 5000 tons lately have been closed.

The Humble Oil Co. has placed an order for eight 80,000-barrel oil tanks with the Riter-Conley Co. requiring 2500 tons and also for three 55,000 barrel tanks requiring 600 tons, with the Pittsburgh-Des Moines Steel Co. Other tank business is pending.

New Orders Falling Off

Philadelphia, July 3.—While specifications on plate contracts continued good in the past week, new orders are falling off so that the total tonnage ahead of mills is shrinking. One mill reports that due to hot weather, scarcity of labor, and other factors which have halted production, its deliveries are falling behind. The price of 2.50c, base Pittsburgh or 2.82c delivered Philadelphia, is applying on the most attractive business, although occasional sales continue to be made at 2.60c Pittsburgh.

To Build Ore Road

Birmingham, Ala., July 3.—The Tennessee Coal, Iron & Railroad Co. will construct a single line standard gage railway from the Wenonah division of ore mines on Red Mountain in a straight line to connect with the company's existing tracks in the vicinity of the Fairfield steelworks and the Fairfield coke works, according to an official announcement by President George G. Crawford. The length of the track will be approximately five miles. Red ore will be transported from all the Tennessee company's mines on Red Mountain to the furnaces at Ensley and Bessemer.

The plan of this railroad track has been determined upon with particular reference to safety, speed and economy in operation. It will be elevated along the entire route, public roads, street railways and railroad tracks being spanned with suitable bridges. Construction will be undertaken at once. The cost has been estimated at $4,000,000.

Call for Cost Figures

Washington, July 3.—F. M. Leonard, assistant chief of the metals division of the tariff commission, will leave on July 5 with three assistants to visit southern merchant blast furnaces. They will fill questionnaires aimed to uncover pig production costs as part of the commission's inquiry to determine whether an increase in the pig iron duty is warranted. Paul F. Tyler, chief of the metals division, expects to leave Washington on July 9 to perform the same function at eastern furnaces.

Concrete Demand Heavier

Awards Still Light But Prices Strengthen Under Increased Buying—Buildings Redesigned for Reinforcing Bars Enlarge Inquiry

REINFORCING BAR PRICES, PAGE 5

Cleveland, July 3.—Increased activity in buying, although mainly of small tonnages, was present in the concrete reinforcing bar market during the past week. Small tonnage projects continue to be brought up for figures, with several larger jobs in prospect. No awards ot any size were made during the week in this district, one of the largest, calling for from 60 to 80 tons, for the Jeavons Mfg. Co., Cleveland, went to Paterson-Leitch Co. Another 50-ton lot for paving at Lorain, O., went to Concrete Steel Co. No further weakening in the price level was noted, the increased buying strengthening competition for bars. There is some tendency to shade 2.75c, base Pittsburgh, on goods out of stock. New steel bars are strong at 2.40c, base Pittsburgh. On re-rolled bars 2.35c, mill, on carloads is openly made and the figure is being shaded $1 and $2 per ton on desirable business.

Western Sales Continue Good

Chicago, July 3.—Buying of reinforcing bars has not felt the usual mid-summer lull, in spite of the heavy bookings which have been the rule with all dealers since early last winter. Not only are there a fair number of sales involving more than 100 tons each, but also the aggregate of small lots runs the total sales to a satisfactory figure. Deliveries from mills are improving considerably and the expected difficulties in meeting the requirements of builders probably will not be met. Prices continue steady at 3.15c, Chicago warehouse, and there is no definte indication of a change at present. The Fair store at Chicago has asked new bids on its proposed enlargement, after having rejected two former tenders.

Small Lettings Coming In

Pittsburgh, July 3.—Small jobs requiring reinforcing concrete bars are increasing in number and are going up in every direction reached by the Pittsburgh market. These jobs usually involve a carload, or 100 tons at the most at a time. Included in recent projects up for figures are the Chatham elementary school, and the Salvation Army institute building, Pittsburgh; a power house and engine house annex for the Pennsylvania railroad at Columbus, O., and a building at Johnstown, Pa., for the Penn Traffic Co. The 700-ton lot for the Bessemer & Lake Erie railroad dock at Conneaut, O., has not as yet been awarded so far as reported here. Mill prices are unchanged at 2.40c, base Pittsburgh, and fabricators continue to quote 2.55c to 2.75c out of stock.

CONCRETE CONTRACTS PLACED

Awards this week .....2070 tons
Awards last week .....1745 tons
Awards two weeks ago .....7665 tons

500 tons, Phalen creek sewer, St. Paul, Minn., for Northern Pacific railroad, to Kalman Steel Co.
250 tons, veterans' hospital, St. Cloud, Minn., to Cowin & Co., Inc.
200 tons, school building at Ely, Minn., to Corrugated Bar Co.
165 tons, building No. 6, Underwriters Laboratories, Chicago, to Barton Spiderweb system.
160 tons, new science building for Marquette university, Milwaukee, to Corrugated Bar Co.
150 tons, office building for Chicago, Milwaukee & St. Paul Railroad Co., Southport and Fullerton Aves., Chicago, to Corrugated Bar Co.
150 tons, State reformatory, Pendleton, Ind., to unknown fabricator.
125 tons, office building for Pelknap Realty Co., Milwaukee, to Concrete Engineering Co.
110 tons, work for Great Northern railroad, to Concrete Steel Co.
110 tons, highway work in Illinois, to Kalman Steel Co.
100 tons, parochial school, Dubuque, Iowa to Kalman Steel Co.
100 tons, building for Stockmens Trust & Savings bank, Chicago, to Concrete Steel Co.
100 tons, building Covenant club, Chicago, to Truscon Steel Co.

CONCRETE CONTRACTS PENDING

700 tons, dock at Conneaut, O., for the Bessemer & Lake Erie railroad; bids being tabulated.
400 tons, additional stories, sub-basements, and addition to the Fair store, Chicago; revised bids asked for July 5.
200 tons, Hotel Jamestown, Jamestwn, N. Y.; pending.
150 tons, institute building for the Salvation army, Pittsburgh; bids being taken.
100 tons, power house and engine house annex for the Pennsylvania railroad, Columbus, O., bids being taken.
100 tons, building for the Penn Traffic Co., Johnstown, Pa.; bids being taken.
100 tons, Chatham elementary school, Pittsburgh; bids being taken.
Tonnage not stated, State street viaduct, Akron, O.; pending.

Pipe Deliveries

Still Sought—Order Books Filled—New Buying Small

Pittsburgh, July 3.—Interesting developments in connection with tubular goods are few although in the past week one inquiry for 250 miles of 4 and 6-inch line pipe for a Toronto, Ont., interest developed. Pressure for delivery of standard full weight merchant pipe is unceasing. Jobbers are endeavoring to place themselves in better position to meet the heavy demand for pipe for house buildings, etc. Output will be somewhat curtailed during the present week owing to the shutting down of certain departments for repairs. Labor supplies still are short. Back orders of both users and jobbers are sufficiently sizable to keep the mills filled with business for many weeks. Owing to this condition they are not unduly concerned about the lack of new forward buying. Some slowing up in the purchase of oil country goods is encountered owing to the lower price levels now prevailing in connection with crude oil. Heavy demands still are made, however, for the shipment of tonnage on order so that projects now under way can be completed.

Small Lettings Coming In

Birmingham, Ala., July 2.—Pressure pipe plants in the southern territory continue working to capacity. Small lettings still predominate. The National Cast Iron Pipe Co. is producing about 200 tons of pipe daily and by Aug. 15 will be ready to place four De Lavaud machines in operation. All three pipe makers have received new business the past week. The American Cast Iron Pipe Co. has been awarded 321 tons by Knox City, Texas, 1048 tons by Longview, Wash., and 1509 tons by Bismark, N. Dak. Hope is expressed that a proposed raise in water rates from Alabama to California ports scheduled for Aug. 1 may be averted.

Little Municipal Inquiry

New York, July 3.—R. D. Wood & Co., are low bidders on 750 tons of cast iron pipe for Mt. Vernon, N. Y. Little else in the way of municipal inquiry is pending, with the market generally relatively quiet. However, with sellers well sold into the fall, the market is firm.

Shops Not Seeking Buyers

Chicago, July 3.—Makers of cast iron pipe have sufficient business on books to make them independent and most are not seeking business aggressively. Moderate inquiry is resulting in sales and the volume of business being booked is sufficient to equal shipments. The National Cast Iron Pipe Co. has booked 350 tons for Gridley, Ill., and the United States Cast Iron Pipe & Foundry Co., 175 tons for Cayuga, Ind. Bids on 300 tons at Joliet, Ill. have been rejected and buying will be deferred. Bids will be opened about June 12 at Minneapolis on 1500 to 2000 tons.

Labor Shortage

Hinders Wire Production—Users Seeking Deliveries On Contracts

Pittsburgh, July 3.—Strenuous calls are made for wire tonnage by jobbers and users but the mills are handicapped by labor shortages. During the coming week output will be further hampered by shutdowns for repairs which no longer can be postponed. New buying is withheld in many directions but this only is natural since because of filled up order books, purchasers do not wish to buy now for shipment three or four months hence. On some sizes of nails deliveries are deferred as much as three months although most items can be had within 60 days. More buying of fencing is going on than producers expected at this time, some carload lots, a fair number of mixed carloads, and a few less-than-carload quantities. Automotive, railroad and other consuming lines are active; material is going into consumption and no cancellations or sizable suspensions are being received, so that the market has a firm foundation. The wire base is unchanged at 2.75c and nails still are quoted at 3.00c, base Pittsburgh.

Wire Holds Up Well

Chicago, July 3.—While demand for wire and nails from agricultural sections has fallen off considerably, manufacturers using these commodities continue to require large tonnages. Purchasers are pressing for deliveries and mills are considerably behind. Fencing is being bought actively under the fall terms arrangement and departments

turning out this material are busy. While prices are unchanged, occasional instances are met of shading, which is believed to emanate from southern Ohio.

Jobbers Receiving Large Volume of Orders

New York, July 3.—Steadiness continues to characterize the local warehouse market, there being little weakness noted in any description. Trading is less active but nevertheless fairly good. Principle interest is still being centered on reinforcing bars. Jobbers, generally report that business in June was less active than in May.

Sheets Marked Down

Boston, July 3.—Iron and steel warehouse prices are unstable although most commodities are holding to the old levels. Here and there where stocks have been unusually heavy, concessions have been made during the past week in order to move a heavier tonnage and at the first of July black sheets and galvanized sheets were marked down 30 cents per 100 pounds making the new price for No. 28 black sheets 5.45c and for No. 28 galvanized sheets 6.60c. Warehouse trade in light structural shapes is holding up well. In bars a decline in demand is reported.

Prices and Demand Steady

Detroit, July 3.—Prices on iron and steel products out of warehouse are steady with demand somewhat larger than in the same period last year. There is some letup in the buying of auto body sheets, but dealers regard this as seasonal. Sheet prices are steady. Demand for small structural shapes continues large owing to a liberal amount of building repair work. Stocks in all lines are better than they were the first of the month.

Heavy Demand Continues

Philadelphia, July 3.—Demand for iron and steel products out of warehouse continues heavy. While there is some slight variation, the local market generally is strong and prices are unchanged. As previously noted, prices on out-of-town shipments are determined by New York and Baltimore competition.

Prices Are Unchanged

Cleveland, July 3.—There is practically no change in the local warehouse market here from a week ago. Prices are unchanged and jobbers report demand heavy. While large individual orders are not numerous the volume of small orders placed is said to be exceptionally large.

Open Sales Agency

D. M. Kelly and R. E. Murphy, formerly connected with the Bourne-Fuller Co., Cleveland, in sales capacities, have opened an office at 506 McKerchey building, Detroit, where they will act as sales agents for various companies in the iron and steel and allied industries. At the present time they represent the Lake Erie Bolt & Nut Co., Cleveland, and the Sandusky Nut Co., Sandusky, O.

Sheet Specifying Is Good

New Buying, However, Is Light, and Mill Operations Irregular—Prices on Black and Other Grades Holding Firm

SHEET PRICES, PAGE 5

Youngstown, O., July 3.—Little change in the sheet market is apparent. Makers report that specifications are being issued in sufficient volume to maintain full rolling schedules. Production, however, during the latter part of June was curtailed considerably on account of the hot weather and it was necessary in some cases to carry over tonnage into this quarter. While reports of spots in the black market are heard they lack foundation. On inquiries for black coming into this district the price of 3.85c Pittsburgh, is being quoted. The volume of black sheet business pending is not large and frequently involves from a few sheets to bundled lots. The inquiry for 1800 tons of black barrel stock put out about 10 days ago has been withdrawn. According to the latest advice the order for the drums was placed with a different fabricator who will issue specifications against its sheet contract made with a mill outside this district. Black sheets of tin mill sizes are quoted here from 3.85c to 4.00c, Pittsburgh. The demand for blue annealed continues in fair volume and some makers report sales at 3.25c base Pittsburgh, which price is minimum with two producers. Other makers of blue annealed are quoting this grade at 3.00c, bases. Galvanized continues quotable at 5.00c, base Pittsburgh, by the few makers here now operating galvanized units. The railroads are becoming more strict in the enforcement of the standard method of bracing sheets in box cars and have returned a large number of carriers to certain mills which have been bracing shipments by methods other than required. High grade sheets are priced at 5.35c, Pittsburgh, for the third quarter and a good volume of business has been entered against this figure.

Operations Are Spasmodic

Pittsburgh, July 3.—During this week and next, sheet mill operation will be more or less spasmodic, depending upon the extent of curtailment due to mill shutdowns for overhauling and repairs. With some mills, particularly among the Steel corporation units, the shutdown will only extend over July 4, but they will be handicapped in output since full crews probably will not show up until the early part of next week. The majority of the mills would, if possible, operate steadily throughout the week since all have good order books and find it difficult to satisfy the wants of their customers. While there is a tendency to withhold forward buying, it is because most consumers are well protected for weeks and in some cases months to come. They are issuing specifications regularly and an important factor from the mill standpoint is the fact that the material is being consumed quickly.

Manufacturers of sheet metal articles are busy and their calls from week to week for tonnage grow more insistent so that it is difficult for the sheet mills properly to satisfy them all. Many mills have material on hand to maintain satisfactory delivery service during the period of idleness. Among consumers of automobile sheets, delay is encountered in getting out new models. New sizes have not as yet been decided upon or at least the new dies have not been secured. This has brought about the usual summer delay in the specifying of automotive sheets, but suspensions otherwise are of meager proportions. Mills state they are free from cancellations. Prices on the bases of the American Sheet & Tin Plate Co. levels are firm. For black sheets, some divergence from 3.85c, base Pittsburgh, is seen at times in connection with stocks certain mills wish to dispose of, and on these they take 3.75c. Galvanized sheets appear to have settled to the 5.00c base, no divergence from that level being noted. Blue annealed sheets are quoted at 3.00c to 3.25c, and full-finished automobile sheets at 5.35c, base Pittsburgh.

Mills Have Good Schedules

Philadelphia, July 3.—Sheet demand is fair and mills have good schedules through the third quarter. As a rule the market is firm. Blue annealed is 3.00c to 3.25c, Pittsburgh, or 3.32c to 3.57c, Philadelphia. Black sheets generally are 3.85c, Pittsburgh, although occasional sales are made at 3.75c. Galvanized sheets are firm at 5.09c, Pittsburgh.

Sheet Users Seek Delivery

Chicago, July 3.—Conditions in the steel sheet market are steady and price appear to be firm. The recent cooler weather has brought production back somewhat and mills are operating at a better rate than a week ago. Consumers are insistent for immediate shipment and mills are unable to meet the desires of their customers. Some selling into fourth quarter is being done, a recent purchase for oil storage tanks including 1000 tons of sheets.

Hold Basing Point Hearing

Supplementing the extensive hearings held in Milwaukee early in 1922, the federal trade commission on June 29 took testimony concerning the consumption of steel by 10 leading Milwaukee fabricators and manufacturers, immediately adjourning back to Chicago. Examiner J. W. Bennett had charge of the hearing and the commission was represented by Karl E. Steinhauer, while counsel for the Steel corporation was William Clarke. The additional testimony was taken at the request of the corporation, it is said, to show that production of steel material in Milwaukee is smaller than consumption, which has a bearing on the Pittsburgh basing suit.

Officials and employes of the United States Steel Corp., New York, held their annual outing at Bear Mountain, N. Y., June 30.

Shape Buying Still Light

Buyers of Large Tonnages Continue to Await Price Weakness—Fall Building Promises Heavier Demand

STRUCTURAL SHAPE PRICES, PAGE 5

New York, July 3.—Structural awards the past few days have been light, although the market is far from dull. One feature is the change of plans in the case of several projects from steel to reinforced concrete. Assurance of continued high wages in certain building trades as a result of the recent settlement of the bricklayers strike at higher schedules to prevail for two years is the principal contributing factor. Prices are steady on shapes at 2.50c, Pittsburgh, or 2.84c, New York.

Fall Building Looms Large

Boston, July 3.—Building in the fall in New England and especially in greater Boston bids fair to be unusually heavy. The recent satisfactory settlement of the building labor situation has been the signal for plans to go ahead on many of the larger projects. Within the last few days purchase of the complete block at Tremont and Hollis street has been completed and plans are now being rushed for a new 14-story theatre and office building which will take from 3000 to 5000 tons. Contract for the steel will be placed on a per ton basis without waiting for the complete plans. Other active large projects total from 12,000 to 15,000 tons. At the present time small awards are the rule, but fabricating shops are all booked far enough in the future to make new building prices decidedly firm. Steel for business buildings ranges from $95 to $105 fabricated and delivered. Structural shapes in this market are held firm at 2.50c, base Pittsburgh by the leading interests although occasional sales at 2.45c, are still reported.

Deliveries Much Deferred

Pittsburgh, July 3.—Structural shape demand upon the mills still is heavy and deliveries are as much deferred as previously, the extreme now being 12 weeks hence. New buying is limited somewhat, although certain contracts for third quarter requirements of fabricators lately have been closed up. So far as can be learned, all of these have been at the 2.50c, base Pittsburgh figure, that price representing the firm market here. Awards this week were confined to small unimportant tonnages. Some sizable projects are expected to develop here in the near future. A fairly large number of small buildings such as tanks, schools, shops, etc., are up for bids and one or two bridge jobs involving larger tonnages are in the formative stage but all await the ironing out of certain difficulties. Fabricators generally require three months on a small fabrication job while from four to six months is the time required on more difficult work. Competition still is exceedingly keen among the fabricators, as developed by recent sets of bids.

Prices Stiffen on Small Lots

Cleveland, July 3.—Prices on small tonnages of fabricated shapes were somewhat stiffer during the past week, although on amounts aggregating several hundred tons or more, concessions are still the rule. Inquiries for the week again were composed of lots of from 20 to 50 tons for miscellaneous work. Fall building plans promise heavier tonnage before the end of this quarter. One project already brought out is that of a new 16-story hotel on Superior avenue, Cleveland, which will require approximately 3000 tons of steel. The general contract for this is held by Crafts Construction Co. The Niagara Falls Hotel, Niagara Falls, N. Y., will require from 1200 to 1500 tons of structural shapes. Bids are being asked on this project. On small lots of plain material 2.50c to 2.60c, base Pittsburgh, the general market price, is strong. For western shipment, eastern mills have quoted as low as 2.50c, base mill.

Shape Demands Smaller

Philadelphia, July 3.—Structural shape orders during the past week were smaller than shipments so that the order books are shrinking somewhat. Shading has developed on large lots and in some instances 2.40c, base Pittsburgh, has been quoted. Such business, however, is exceptional, as the usual price continues at 2.50c, base Pittsburgh and most makers firmly maintain this figure. It is expected that action will be taken this month on one or two boats for the Clyde Steamship Co. The feature of the current demand is the continued volume of orders being received from the South for plain shapes.

Lull in Building Demand

Chicago, July 3.—Buying of fabricated material in the Chicago district has fallen off to practically nothing during the past week and conditions are quieter than they have been in a long time. Fabricators have full order books and are not worried over the situation as they have plenty to keep their shops busy almost through the present year. Plain material is quoted at 2.60c to 2.70c, Chicago mill, although it is not likely that any prompt material at the higher figure is available now.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 7,392 tons
Building awards last week ..... 8,737 tons
Building awards two weeks ago ....14,773 tons

2500 tons, eight 80,000-barrel tanks for the Humble Oil Co., Mexia, Tex., to Riter-Conley Co.

1600 tons, school No. 60, New York, to Bethlehem Fabricators Inc.

1100 tons, transmission towers for the American Gas & Electric Co., West Virginia, to American Bridge Co.

1000 tons, building for Bethlehem Engineering Corp., 1480 Broadway, New York, to Post & McCord.

600 tons, powerhouse for Studebaker Motor Corp., South Bend, Ind., to Massillon Bridge & Structural Co.

600 tons, miscellaneous work in the Pittsburgh territory, including 100 tons for nearby coal tipple, to Pittsburgh Bridge & Iron Works.

600 tons, three 55,000-barrel tanks for the Humble Oil Co., Mexia, Tex., to the Pittsburgh-DesMoines Steel Co.

500 tons, building for the Penn Traffic Co., Johnstown, Pa., to the McClintic-Marshall Co.

377 tons, bridge over Mackinaw river, Lexington, Ill., for Chicago & Alton railroad, to Stroebel Steel Construction Co., fabrication by Mt. Vernon Bridge Co.

300 tons, aerial tramway for the West Penn Power Co., Windsor, Pa., to the Independent Bridge Co.

250 tons, subway for Michigan Central railroad, St. Thomas, Ontario, Canada, to Dominion Bridge Co.

250 tons, extension to Brooks Bros. store, New York, to Hay Foundry & Iron Works.

200 tons, bridge span for American Gas & Electric Co., Philo, O., to American Bridge Co.

200 tons, Belle telephone building, Dormont Borough, Pittsburgh, to the W. M. Kratzer Co.

175 tons, new Saxe theater, Milwaukee, to Lakeside Bridge & Steel Co.

140 tons, St. Cosme bridge near Detroit, to Wisconsin Bridge & Iron Co.

100 tons, building for Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., to Berlin Construction Co.

Tonnage not stated, city auditorium, Birmingham, Ala., to unknown fabricator in Birmingham district.

STRUCTURAL CONTRACTS PENDING

3000 tons, hotel building, Superior avenue near Twelfth street, Cleveland; Crafts Construction Co. general contractors. Bids on steel to be taken in the fall.

3000 tons, new theater at Tremont, Hollis and Dorr streets, Boston; bids being taken.

2000 tons, office building, Boston; bids being taken.

1800 tons, building for General Electric Co., Elmwood avenue, Philadelphia; pending.

1200 to 1500 tons, Niagara Falls hotel, Niagara Falls, N. Y.; bids asked.

1000 tons, Hamilton hotel, Paterson, N. J.; project temporarily withdrawn.

600 tons, First National Bank building, Greensburg, Pa.; bids closed July 3.

500 tons, building for Western Union Telegraph Co., New Orleans; bids in.

500 tons, power station for St. Paul Gas Co., St. Paul, Minn.; bids asked.

400 tons, crane runway, Chicago, for American Car & Foundry Co.; inquiry withdrawn.

300 tons, Illinois Central railroad viaduct at Forty-first street, Chicago; bids asked.

200 tons, shapes and bars for Providence hospital, Everett, Wash.; general construction contract to A. W. Quist & Co., Seattle.

Troops Disperse Sydney Steel Strike Rioters

Sydney, N. S., July 2.—The steel workers of the Dominion Iron & Steel Co., Sydney, went out on strike on June 28 for wage increases and the establishment of the check-off system. Fighting took place in the evening between strikers and the police and when Magistrate W. A. G. Hill attempted to read the riot act he was struck on the head with a stone and rendered unconscious. Several policemen were also hurt. Government troops were summoned and dispersed a mob of several thousand strikers and their sympathizers by firing a volley over their heads after they had battered down the gates of the Whitney Pier steel mill.

Heads Phoenix Company

Samuel J. Reeves has been elected president of the Phoenix Iron Co., Philadelphia. He was vice president in charge of purchases for the company. George C. Carson Jr., has been elected vice president and treasurer, and George G. White was re-elected secretary. William H. Reeves was elected chairman of the board.

Operations Are Started

The Beliot, Wis., works of the Wanner Malleable Castings Co., Hammond, Ind., has been placed in operation, the first heat being poured during the past week. When in full

production about 1200 tons of castings per month will be produced. This plant recently was purchased by the Wanner company from the Stewart, Warner Speedometer Corp.

Beehive Coke Output Shows Weekly Gain

Washington,, July 3.—The production of beehive coke increased during the third week of June, according to the geological survey. According to the reports of the principal coke carriers the total output was approximately 413,000 net tons, an increase over the revised figure for the week preceding of 6000 tons. Practically the entire increase occurred in Kentucky and Alabama where one railroad reported loadings nearly twice as large as those the week before. Production in all other districts except Pennsylvania and Ohio was practically the same as in the week ended June 16. The weekly comparative figures follow:

	Week Ended		
	June 23 1923 a	June 16 1923 b	June 24 1922
Pennsylvania and Ohio	327,000	333,000	77,000
West Virginia	22,000	20,000	8,000
Ala., Ky., Tenn., and Ga.	35,000	24,000	10,000
Virginia	14,000	15,000	7,000
Colorado and New Mexico	8,000	8,000	5,000
Washington and Utah	7,000	7,000	3,000
United States Total	413,000	407,000	110,000
Daily Average	69,000	68,000	18,000

(a) Subject to revision.
(b) Revised from last report.

The rate of soft coal production continues steadily downward and the total output for the week ended June 23 was 10,411,000 tons, compared with 10,676,000 two weeks before. The preliminary estimate for the week ended June 30 resulted in a further decline.

Safety in Steel Mills To Be Discussed

Chicago, July 3.—Safety in foundries and steel mills will be discussed in the metals section of the National Safety council at the twelfth annual safety congress of that body at Buffalo, Oct. 1-5. The program has been sufficiently outlined to indicate the subjects to be considered at the two sessions devoted to this section.

A feature of the round table session will be the presentation by 11 employes of the Carnegie Steel Co. of a playlet in exact reproduction of a meeting of an employes' safety committee.

The program for the automotive section will include an exhibit, demonstration and discussion of punch press hazards and discussion of the new safety code for forging plants developed by the National Safety council and the American Drop Forge association.

The program for the metals section is as follows:

Wednesday, Oct. 3, 10 a. m.

Handling Material in a Foundry by Benjamin F. Faune, superintendent wheel plant, Cambria Steel Co., Johnstown, Pa. Plant Railways.

Thursday ,Oct. 4, 10 a. m.

Fire Protection in Steel Mills and Foundries by J. M. Woltz, Youngstown Sheet & Tube Co. Relation of Medical and Safety Departments by D. G. H. McKinstry, Spang-Chalfant Co., Pittsburgh.

More Roads Want Rails

Seek to Place Additional Tonnages with Mills—Car Buying in June Falls Below 2300 Mark of May

RAILROAD TRACK MATERIAL PRICES, PAGE 5

New York, July 3.—Car buying continues restricted to small scattered orders. Inquiry also is of light character. Locomotive buying is featured by an order for 36 electric locomotives for the Virginian railway, the business going to the American Locomotive Co. and the Westinghouse Electric & Mfg. Co. Other orders include 10 switch engines for the Union railroad, the contract going to the Lima Locomotive Works and five locomotives for the Gulf, Mobile & Northern; one for the Donovan Crockery Co., two for the Rede Sul Minera, Brazil, and one rack engine for the Arica-La-Paz, Chile, all going to the Baldwin Locomotive Works.

While returns for June have not been fully received, there is little doubt but what car buying was the lightest this year, even falling under the total for May when approximately 2300 cars were placed. Locomotive buying, however, was fairly active.

Market Shows No Change

Pittsburgh, July 3.—The light rail market shows practically no change from the last week or two. Operating coal mines continue to order small lots as needed, usually single carloads. One order placed this past week, however, involved three carloads. Regular contracts are being specified against with a fair degree of regularity. The mills have maintained the 2.25c, base Pittsburgh, figure for many weeks past, since in a highly competitive market of this kind, due to shortage of demand, it is impossible to increase quotations. The rerolling mills continue to offer concessions of $1 or $2 per ton.

Track bolts are not in heavy demand although a few orders are placed from time to time for the standard sizes. On these, prices below 4.00c recently have developed but that figure represents the general market. On small track bolts for coal mine use demand is exceedingly limited but the spread of 5.00c to 5.50c, base Pittsburgh, is being maintained. Small spikes are unchanged at 3.75c and these also suffer owing to lack of operations among the coal mines. Standard spikes at 3.15c are being bought in fair sized lots by different railroads although the greater activity is found in specifications against contracts. The same applies to tie plates at 2.60c to 2.75c, base Pittsburgh.

Demand Much Track Material

Chicago, July 3.—Railroad needs for track building and maintenance continue to offer a large tonnage to steel mills. The inquiry of the Illinois Central for 60,000 tons of rails still is pending. The Norfolk & Western railroad has asked consideration of an inquiry for 50,000 tons and the Nickel Plate railroad has indicated that it desires to cover its 1924 requirements. Track fastenings continue to be bought and further demand in this line is appearing. One buyer seeks 5000 kegs of spikes and another railroad will be in the market shortly for several thousand kegs of spikes and bolts. An unusually heavy inquiry for steel car wheels is coming out and one western producer is considering an aggregate of about 10,000 wheels. Car buying is practically absent. The Seaboard Air line has placed repairs on 2000 cars with several builders. The Burlington railroad has decided not to buy 200 coal cars for which it inquired recently.

Takes Car Repair Order

Cleveland, July 3.—An order for 10 locomotives has been placed by the Union railroad with the Lima Locomotive Works. The Canton Car Co. has received an order from the Western Maryland railroad to repair a large number of freight cars. This will require about 3000 tons of steel.

CAR ORDERS PLACED

Seaboard Air line, repairs, 1100 box cars, to the Richmond car works, 100 box cars to Liberty Iron & Steel Co., 300 box cars, to Georgia Car Co., 100 box cars, to Tampa Dry Dock Co., and 400 hoppers, to Virginia Bridge & Iron Co.

Shell Oil Co. of California, 60 tank cars, to Pennsylvania Tank Car Co.

Virginia railway, 25 gondolas, to the Pressed Steel Car Co.

CAR ORDERS PENDING

Atchison, Topeka & Santa Fe railroad 300 gondolas; bids asked.

Birmingham Southern railroad, 50 coal cars; pending.

Central Railroad of New Jersey, repairs to 300 hopper cars; bids asked.

Muscle Shoals, Birmingham & Pensacola, railroad, 200 miscellaneous cars, including box, hopper, gondola and flat cars; pending.

Northwestern Railway of Brazil, 50 stock cars; bids asked.

Missouri Pacific railroad, 15 coaches; pending.

Anaconda Copper Mining Co., six flat cars and two ballast cars; pending. This is in addition to 24 dump cars carried as pending in issue of June 21.

Acquires Furnace Company

Manufacture of Baily electric melting furnaces for melting nonferrous metals, high temperature heating furnaces and metallic element heat treating and annealing furnaces, will be continued by a new organization which has purchased the Electric Furnace Co., Salem, O. Officers of the new organization are: President, F. A. Hoiles; vice president, secretary and sales manager, R. F. Benzinger and treasurer and general manager, F. T. Cope.

Ore Tax Data Sought

Duluth, July 3.—The first step to collect the occupational mining tax has been taken by the state of Minnesota. Blanks have been issued for mining reports for the past two years. It is estimated the tax will aggregate $5,000,000.

Docks here are breaking shipment records. The Missabe dock, within 73 hours, loaded 51 steamers with 400,000 tons of ore.

The Nonferrous Metals

Buying Light and Prices Fall All Through List Except on Aluminum and Antimony—Shipments Good

	Copper—Electro delivered	Copper—Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
June 27....	15.00	15.00	39.25	7.00	5.75	26.00	7.00	29.00
June 28....	15.00	15.00	38.87½	6.85	5.75	26.00	7.00	29.00
June 29....	14.75	15.00	30.12½	6.85	5.75	26.00	7.00	29.00
July 2....	14.62½	14.62½	37.50	6.85	5.75	26.00	7.00	29.00

†Outside market quotation.

NEW YORK, July 3.—Business in all the nonferrous metals has continued extremely light with consumers intent on working out present orders on their books and buying materials only against actual "must" requirements. Prices of raw materials have eased in most lines, as some producers have been anxious to accumulate backlog tonnage, but price concessions have failed to stimulate interest. European conditions continue to exercise an important influence in our metal markets, American markets moving in accordance with London, which is a barometer of world markets. In general, however, the domestic metal industries are operating at high rates and consumption of virgin metals has decreased but little if at all.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 24 oz., min.	23.75
High brass	19.75
Zinc, ga. 9 to 18 (plates ½c less)	8.90
Lead, full sheets (cut ¼c more)	10.75
Aluminum, base 18 ga. and up...	35.40
SEAMLESS TUBES	
High brass	25.50
Copper	27.00
RODS	
High brass, round, ⅝ to 2½ inch	18.00
Naval brass rod	20.25
WIRE	
Copper	17.25 to 18.00
High brass	20.25

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.50 to 10.00
New York	9.25 to 9.50
Chicago	8.25 to 9.00
HEAVY YELLOW BRASS	
New York	6.50 to 7.00
Chicago	7.00
Cleveland	6.50 to 7.00
ZINC	
New York	4.25
Cleveland	3.00 to 3.25
HEAVY COPPER AND WIRE	
Cleveland	11.50 to 12.00
New York	11.50 to 12.00
Chicago	11.00 to 11.25
RED BRASS TURNINGS	
New York	8.75 to 9.00
Cleveland	8.50 to 9.00
Chicago	6.75 to 8.00
YELLOW BRASS TUBING	
Cleveland	6.00 to 6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.75 to 7.00
Chicago	7.00
ALUMINUM BORINGS	
Cleveland	10.00 to 11.00

Copper prices still continue weak, with concessions made by some first hand sellers below 14.75c, delivered, although some large agencies maintained a quotation of 15c delivered, and reported small sales at that price. Pressure to sell by some dealers caused a sharp reaction in outside prices, as low as 14.37½c, refinery, being reported done on one or two transactions. European demand has been slow and domestic consumers have manifested no real interest. Casting copper sold down to 14.25c, refinery; lake at 14.75c to 15.00c delivered.

Quotations on copper and brass-rolled products were reduced this week, amounting to a cut of ½ cent on copper products and ¾ cent on brass products; excluding brass and copper seamless tubes. The base price for bare copper wire is 17.75c. Mills continue to report two to three months' specified business on books.

Lead prices were reduced this week. The American Smelting & Refining Co. made a reduction of $3 a ton June 28 to 6.85c, New York to avert import offerings. This reduction was adopted by other sellers. Western prices also declined. St. Louis continuing at the full freight differential under New York, 35 points. Lead was obtainable at 6.50c to 6.60c at the close of last week.

Zinc prices declined steadily until they reached 5.75c, East St. Louis, when the decline was checked. The volume of business has been extremely light. Recently the London market has shown more strength, but not for a sufficient time to encourage hopes of renewed exports of American zinc. High grade zinc prices are nominally at 8c to 8.50c delivered.

Tin has been weak, due to expectation of unfavorable statistics as of July 2. The American deliveries were expected to show a falling off, while total world shipments were expected to be shown as heavy. Prices declined in London and America, to lowest prices since December ranging between 37.50c and 39.75c for Straits tin.

Antimony has been in small demand, but holders have been less anxious to sell, generally holding carlots at 7c, duty paid. Small lots commanded a little over 7c. Futures are held at about the same basis.

Virgin ingot aluminum has been scarce and high priced, due to purchases in the outside market by consumers who had not fully estimated their requirements. Prices show a wide variance, but some virgin ingot 98 to 99 per cent in warehouse has been obtainable at 26c, New York. Scrap prices have been steady.

To Act As Sales Agents

Vrabek & Kessler, 149 Singer building, New York, have been appointed eastern sales representatives for the Champion Engineering Co., Kenton, O., manufacturer of electric overhead cranes, sluice gates and other equipment. Vrabek & Kessler, recently organized, also are eastern representatives of the Stearns Conveyor Co., Cleveland, and the Stedman's Foundry & Machine Works, Aurora, Ind. Prior to the formation of the company J. S. Vrabek was for several years sales manager for the Sturtevant Mill Co., Boston, manufacturer of crushing machinery, etc., and prior to his affiliation with that company was associated with Allis-Chalmers Mfg. Co., West Allis, Wis.

H. H. Kessler upon graduating from Cornell university, was for several years associated with the Atlas Portland Cement Co. Following the war during, which he was an officer of the ordnance department, he became associated with the Hardinge Conical Mills Co., 120 Broadway, New York, serving also as special representative of the Stacey-Smith Mfg. Co.

Freight Tariffs Stand

Washington, July 3.—The investigation and suspension board of the interstate commerce commission has declined to suspend tariffs adjusting freight rates on iron and steel articles from the Pittsburgh and Buffalo districts to southern points, and from southern points to southern points. The proposal of the carriers to inaugurate new rates, effecting both increases and decreases, on a formula plan similar to that set up in I. & S. 1303, whereby commodity rates have been established by taking a certain percentage of the class rates, is upheld. The new tariffs become effective on July 1, as proposed. The United States Steel Corp., Bethlehem Steel Corp. and other producers had asked for the suspension of the tariffs.

Chicago Is Unchanged

Chicago, July 3.—No change has taken place recently in the schedule of mill operations by the Illinois Steel Co. or independent mills at Chicago. A full day will be lost by all mills over July 4 and in some cases three turns will be missed. Production is on the highest figure it has been for some time, except in departments where the heat prevented a full force during the early part of last week.

Georgia Clay Is Tested

Washington, July 3.—Following an investigation of the washing and utilization of certain Georgia clays, some of these clays are being tried out commercially in the manufacture of refractories, tile and brick, the United States bureau of mines states. The tests were made at the bureau's ceramic experiment station at Columbus, O.

Northwest Demand Less

Weakening Prices Noted in Some Lines—Railroads Announce Reduction in Westbound Rates on Machinery Effective Aug. 1

SEATTLE, June 30.—With the approaching midsummer holiday in the logging industry at hand and a slight recession in building activity, the iron and steel trade reports less demand and in some branches prices are off.

As far as known, iron and steel dealers have been unable to contract for the movement of their cargo by water from Atlantic terminals to this coast at present rates after Aug. 1. On the latter date the new tariff of the reorganized intercoastal conference takes effect. Demand for space is brisk and the steamship lines are not inclined to continue hauling steel and iron at the low basis of 30 cents which has prevailed since July 1, 1922. The westbound movement of products of the steel mills is exceedingly heavy at present and it is expected to continue brisk for at least 30 days more.

Overland roads have announced a considerable reduction in westbound rates on machinery and other commodities from Chicago effective Aug. 1. The new carload rate on machinery will be $1.93 per 100 pounds, the present rate being $2.27½.

Pig Iron And Coke

While the buying movement has eased off dealers interpret the future position of pig iron as strong. They are counting on a heavy buying movement in the fall. The best grades of British and Scotch iron have declined from $40 to $39, paid, here but the drop is thought to be only temporary and a reflection of the general caution now being exercised throughout the country. Foundries are buying only from hand to mouth. In 60 days importers of iron believe the situation will be much improved.

The coke market shows no marked change. Demand is slightly off in sympathy with pig iron but the foundries are using nearly a normal quantity of coke.

Bars, Plates And Shapes

Both manufacturers and jobbers report these items moving in good volume. The demand for reinforcing steel continues more active than that for merchant bars. Prices are unchanged, steel bars being steady at 4.10c, large shapes at 4.20c and plates at 4.25c, jobbers' prices. The Pacific Coast Steel Co. is quoting 3.20c on merchant bars and reinforcing bars are averaging about 3.50c, fluctuating slightly on different jobs. The steel mill is operating two open-hearth furnaces and is running its full mill capacity. While no outstanding tonnages are reported the movement of reinforcing is satisfactory in small lots running from single carloads to 100 tons, the aggregate giving the plant ample work for some time forward. Export inquiries for steel are not numerous although one foreign interest last week asked for quotations on 400 tons of reinforcing bars.

Other Finished Materials

Jobbers report business keeping up better than expected. Practically everything in stocks is in good demand, this being especially true of nails, spikes, boiler tubes, pipe and other building materials. Sheets are not as active as expected although reduced prices are still in force at jobbing centers throughout the state. Track spikes have recently been advanced from 4.50c to 4.75c but otherwise the price list remains unchanged.

Old Material

Demand is slack, prices weak and stocks low. Scrap rail which has been strong at $20 has weakened to $18 at which figure one lot was offered this week. Steel scrap is hovering around $14. At this figure exporters find it difficult to lay it down in Japan at prices offered by Oriental buyers. There is no change in No. 1 cast iron scrap. Not much material is moving.

Electrical Engineers Hold Annual Convention

Nearly 1500 engineers from all parts of the United States and from Canada gathered at the New Ocean house, Swampscott, Mass., June 25, for the thirty-ninth annual convention of the American Institute of Electrical Engineers. The sessions were held through the week, the morning session being devoted to the presentation of technical papers and the afternoon sessions to visiting industrial plants in eastern Massachusetts. Frank B. Jewett, president of the institute gave his opening address Tuesday morning and later Charles P. Steinmetz, chief consulting engineer of the General Electric Co., Schenectady, N. Y., opened the technical session with a paper on Cable Charge and Discharge. Harris J. Ryan, the newly elected president gave an informal talk. Mr. Ryan does not formerly take office until later in the year. He is professor of electrical engineering at Leland Stanford university, Palo Alto, Cal., is a graduate of Cornell university and has contributed numerous papers on high voltage investigation and on ceramics in electrical work. In all, 26 papers were presented including, "Cooling of Electric Machines" by G. E. Luke, "Free and Forced Convention of Heat in and Liquids" by C. W. Rice, "Photograhpic Methods of Studying High Voltage" by K. B. McEachron, "Standardization of Electrical Measuring Instruments" by H. P. Brooks, and "High Voltage Generators" by S. R. Bergman.

Influx of Aliens Begins with Fiscal Year

Washington, July 3.—The July influx of aliens will set a new high record, immigration officials believe, because with the turn of the fiscal year on July 1 the quotas were renewed and an unusually large army was awaiting entrance at Ellis Island or en route. The total number admissible in the year beginning July 1 is 357,803—the same as for the year just ended.

The quota of the United Kingdom remains at 77,342, that for Germany 67,607 and that for Italy 42,057. One hundred and nine has been subtracted from the Austrian quota and added to the Hungarian, making the former 7342 and the latter 5747. On July 1 every quota except Germany's was exhausted. This is the final year of the 3 per cent act, it expiring on June 30, 1924 and compelling the congress convening in December to take action.

The latest complete figures of the immigration bureau are for April, and reveal a net gain of 47,924 aliens for that month. For the fiscal year ended with April immigrant arrivals totaled 425,994 and departures 70,284, making the net gain 355,660. The following table gives immigrant arrivals and emigrant departures for the fiscal year to date:

	Immigrants	Emigrants	Net gain
July, 1922	41,241	14,738	26,503
August	42,735	10,448	32,287
September	49,881	7,527	42,354
October	54,129	7,192	46,937
November	49,814	7,077	42,737
December	33,932	8,157	25,775
January, 1923	28,773	4,232	24,541
February	29,927	2,794	27,133
March	42,888	3,610	39,278
April	52,433	4,509	47,924
Fiscal year to date	425,944	70,284	355,660

To Prepare Fluorspar Data

Washington, July 3.—More than 100 consular reports upon fluorspar are being reviewed by the United States bureau of mines in connection with the bureau's preparation of a bulletin on the technology of fluorspar. All members of the consular service were sent a questionnaire asking information as to foreign fluorspar reserves, production, grades, methods, reserves, etc.

A voluntary petition in bankruptcy has been filed in behalf of the Inglis Mfg. Co., Milwaukee, manufacturer of gasoline and oil pumps. The company's liabilities are scheduled at $24,503 and its assets at $21,460. Clement W. Inglis is president of the company.

June Iron Output Shows a Loss

With 3,673,503 Gross Tons, Production Registers a Drop of 194,983 Tons from May—First Half Output Is Largest in History—Operating Stacks Make Gain, Totaling 324 on June 30

COKE pig iron during June showed the first recession in the production rate since it started on its up-grade, or since last September. Figures just compiled indicate that the output of iron during June was 3,673,503 gross tons, or at an average rate of 122,450 tons per day. With the approach of that period of the year which is unfavorable to blast furnace operations, a drop in output was anticipated. During recent weeks a tendency has been noted for putting out furnaces. Some actually have been blown out but the number placed in operation has been surprisingly high with the result that the active list on June 30 exceeded that on May 31 by two.

MONTHLY PRODUCTION

	1923	1922	1921
January	3,228,226	1,645,804	2,414,753
February	2,993,918	1,630,180	1,929,394
March	3,523,595	2,035,908	1,594,866
April	3,546,308	2,070,161	1,190,751
May	3,868,486	2,309,348	1,215,272
June	3,673,503	2,362,455	1,064,007
Total 1st half.	20,834,036	12,053,856	9,409,043
July		2,403,030	864,642
August		1,810,655	954,901
September		2,024,008	985,795
October		2,629,655	1,234,450
November		2,846,110	1,414,958
December		3,083,520	1,642,775
Total 2nd half.		14,796,988	7,097,521
Grand total	20,834,036	26,850,844	16,506,564

Compared with the high production of 3,868,486 gross tons of pig iron in May, the June ouput of 3,673,503 tons was a decrease of 194,983 tons. A part of this loss, however, was due to the fact that June was a 30-day month against the 31 days of May. In spite of the loss, the total for June stands as the second highest on record. On a daily basis the output for June was 122,450 tons per day, which compared with the 124,790-ton rate of the preceding month was a loss of 2340 tons per day.

With the first six months of the year concluded, production totaled 20,834,036 gross tons, or the highest of any other 6-month period in history. Compared with the output of the first half of 1922 of 12,053,856 tons, the 1923 figure is a gain of 8,780,180 tons, or 73 per cent. The average daily rate for the first half was 115,105 tons per day as against 66,595 tons in 1922.

The output of merchant iron in June totaled 898,811 tons and was a loss of 10,915 tons from the 909,726 tons produced in May. On an average daily basis this output, however, represented 29,960 tons per day, as compared with the daily rate of the preceding month of 29,346 tons, the increase being 614 tons per day. Nonmerchant or steelworks furnaces produced 2,774,692 tons in June and showed a loss of 184,068 tons from the 2,958,760 tons of the previous month. This output represented 92,490 tons per day and a loss of 2954 tons from the 95,440-ton rate of May.

Blast furnaces operating on the last day of the month totaled 324, this being a gain of two over the 322 active on the last day of May. This was the highest number of stacks operating since January, 1919, when 330 were in blast. During the month seven merchant furnaces were blown in and five blown out, the net gain for this class being two. Of the nonmerchant class two furnaces were blown out and two blown in. Of the total number of furnaces active on the last day of the month 107 were merchant and 217 were nonmerchant.

AVERAGE DAILY PRODUCTION

	1923	1922	1921	1920	1919
Jan.	104,136	53,090	77,895	87,172	106,654
Feb.	106,925	58,220	68,906	102,904	105,270
Mar.	113,664	65,674	51,447	108,895	99,614
Apr.	118,210	69,005	39,691	91,754	82,479
May	124,790	74,495	39,202	96,510	67,991
June	122,450	78,748	35,466	101,533	70,467
July	.....	77,517	27,892	98,190	78,200
Aug.	.....	58,408	30,802	101,468	88,453
Sep.	.....	67,466	32,857	104,143	82,692
Oct.	.....	84,827	39,821	106,075	60,142
Nov.	.....	94,870	47,165	87,836	80,244
Dec.	.....	99,468	52,992	87,105	84,711
Ave	115.105	73,563	45,223	99,456	83,910

The corresponding figures for May were 105 and 217. On June 30 the Steel corporation was operating 114 furnaces, against 115 on May 31.

Stacks blown in during the month were: In Ohio, River No. 2, McKinney Steel Co. In Pennsylvania: Temple No. 1, Temple Furnace Co.; Sharpsville, Allen S. Davison Co.; Sheridan No. 2, E. J. Lavino & Co.; one Bethlehem and one Lebanon, Bethlehem Steel Co. In New York: Port Henry No. 2, the new 450-ton furnace of Witherbee Sherman & Co.

DIVISIONS OF PRODUCTION

1922	Merchant	Non-merchant	Spiegel	Ferromanganese	Other ferro
Jan.	388,322	1,257,482	1,230	5,644	825
Feb.	355,455	1,274,725	4,930	3,618	872
Mar.	390,643	1,645,265	2,095	11,604	1,102
Apl.	375,814	1,694,347	4,211	14,998	828
May	410,404	1,898,944	4,902	15,432	405
June	423,672	1,938,783	4,817	18,254	854
July	441,752	1,961,278	7,176	18,873	1,887
Aug.	343,522	1,467,143	7,925	11,402	976
Sept.	353,604	1,670,404	4,235	10,681	934
Oct.	502,231	2,127,424	12,285	9,193	1,080
Nov.	603,348	2,242,762	4,192	13,232	961
Dec.	668,950	2,414,570	10,591	17,108	989
Tot'l	5,257,717	21,593,127	68,589	150,039	11,713
1923					
Jan.	713,186	2,515,040	12,056	19,358	952
Feb.	708,901	2,285,017	3,657	21,410	759
March	767,219	2,756,376	13,832	20,730	236
April	795,558	2,750,750	7,440	20,810	670
May	909,726	2,958,760	9,533	19,568	892
June	898,811	2,774,692	8,385	15,671	874

Among the stacks blown out during June were: one Central, American Steel & Wire Co.; Hannah, Republic Iron & Steel Co. In Pennsylvania: Rebecca, Kittanning Iron & Steel Co.; Ella, E. W. Mudge & Co. In Kentucky: Norton, Norton Iron Works. In Tennessee: Napier, Napier Iron Works. In Virginia: Buena Vista, Alleghany Ore & Iron Co. In New Jersey: Musconetcong, Musconetcong Iron Works. In Alabama: Sheffield, Sloss Sheffield Steel & Iron Co.

JUNE PIG IRON

	No. of stacks	No. in blast last day of month: June	May	Total tonnage made: Merchant	Nonmerchant	Totals: June	May
Pennsylvania	155	125	122	245,861	1,121,263	1,367,124	1,441,406
Ohio	80	67	68	186,491	660,494	846,985	880,807
Alabama	43	29	28	139,868	95,987	235,855	246,607
Virginia	19	5	6	25,018	.....	25,018	26,514
New York	27	24	23	111,361	139,300	250,661	263,658
New Jersey	4	3	2	25,944	.....	25,944	24,605
Illinois	26	24	24	66,753	295,455	362,208	372,797
Colorado	5	3	3				
Indiana	16	16	16	33,643	331,369	365,012	405,584
Maryland	6	5	5				
Wisconsin	6	4	4				
Kentucky	7	2	3				
West Virginia	5	4	4	21,847	59,066	80,913	88,224
Tennessee	14	6	7				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	3	3	29,649	59,204	88,853	88,291
Michigan	4	4	4				
Missouri	1	0	0				
Spiegel and ferro—All states	..	..	..	12,376	12,554	24,930	29,993
Totals	425	324	322	898,811	2,774,692	3,673,503	3,868,486

German Prices in Losing Race

Sellers Unable To Speed Them Up as Fast as Mark Goes Down—New Set of Quotations Just Issued—British Bookings Average 60 Per Cent of Output, with Prices Weak—Belgian Business More Active

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, July 3.—Bookings of iron and steel tonnages by British producers average 60 per cent of their output. The market still is weak. Further reductions have been made in prices, especially for pig iron. Middlesbrough No. 3 foundry iron could be purchased today at £5 10s ($25.35).

Market conditions on the Continent are firm due to the Ruhr blockade, and this probably will continue all summer. The Belgian market is more active. Belgian pig iron has been sold up to 480 francs ($25.44), and billets up to 485 francs ($25.70) f. o. b.

The correspondent of IRON TRADE REVIEW at Dusseldorf wires:

"Although German prices continue to advance they are unable to coincide with the downward trend of the mark, which is becoming useless for most business purposes. Prices are largely nominal and are marks ($21.43); hematite 2,712,000 marks ($23.29); changing rapidly. The latest revised German quotations are as follows: No. 3 foundry iron 2,679,000 furnace coke, 773,000 marks ($6.18); foundry coke 805,000 marks ($6.44); billets 3,820,000 marks ($30.56); sheet bars 4,210,000 marks ($33.68); rods 4,000,000 marks ($32); rails, bars and shapes 4,700,000 marks ($37.60); ship plates 5,500,00 marks ($44); sheets 7,800,000 marks ($62.40); wire 5,000,000 marks ($40), and bands 5,900,000 marks ($47.20).

"Owing to the Ruhr complications and the shortage of raw material, German mills are able to take only the most limited export business, for which small tonnages foreign buyers are paying full prices in foreign currencies. Several Ruhr steel works have shut down completely; only 27 blast furnace stacks in that district are operating. Coke producers have agreed to limit production to 15,000 tons daily for the present, hoping to prevent the French from getting fuel from Lorraine."

The Germans are placing orders with Austria and Czecho-slovakia for pig iron and finishing steel to the aggregate of 100,000 tons. Foreign purchasers are not securing deliveries of steel from the Ruhr, as the French are imposing a blockade *defacto*.

Cammell, Laird & Co., large British steelmakers and shipbuilders, are merging with the Leeds Forge, important builders of railroad equipment.

Changes in quotations in the British market during the week bring the following products to the prices as quoted: Billets and sheet bars £7 7s 6d ($34); export English and Scotch beams £9 5s ($42.64); galvanized sheets £18 5s ($84.13); East Coast and West Coast hematite and Middlesbrough basic £5 12s ($25.93); Derbyshire and Staffordshire No. 3 foundry iron £5 2s 6d ($23.63); Northamptonshire No. 3 foundry £5 ($23.05); export furnace and foundry coke £2 10s ($11.53).

Sterling Exchange is figured on a basis of $4.61, and the mark on a basis of $0.000,008.

German Contracts Are in Legal Snarls

WASHINGTON, July 3.—The occupation of the Ruhr and the ensuing restrictions on the import and export of goods have raised a number of difficult legal questions relating to the fulfilment of contracts covering the sale and delivery of goods, writes Maurice Walk, American vice consul at Hamburg, Germany in a report to the department of commerce. He explains the situation as follows:

"A difficult problem arises where the contract has been entered into between a person in the occupied region and a person in unoccupied Germany. The business men in the occupied region contend that they are unable to meet their existing obligations when they fall due and that they must be granted time. On the other hand when they are the sellers of goods to unoccupied Germany, they have insisted on the payment for goods which had been shipped to unoccupied Germany on contracts of sale f.o.b. seller's place of business, but never delivered on account of export prohibitions. Because of the extent of this problem, the courts have been quite unable to deal with it satisfactorily.

"Where the contract of sale between a manufacturer in the occupied district and a buyer in unoccupied Germany is f.o.b. buyer's place of business, and delivery is prevented by the allied export prohibition, the seller can use the defense of *hohere Gewalt* or *fore majeure*. Where, however, the seller in the occupied district is not a manufacturer but a middleman and where the goods are not indigenous to the Ruhr, but can also be obtained elsewhere, there the seller must deliver a substitute or pay damages.

"Greater difficulties are those arising out of contract between parties both of whom are in unoccupied Germany and dealing with goods coming from the occupied territory but held up by allied restriction. In this case the seller is obliged to furnish a substitute. Where, however, the goods are peculiar to the occupied district or can be made out of raw material which are obtainable only from the occupied district, the law is uncertain as to the duties of the seller.

"Further complications are introduced if in the last suppositious case there is added a third party in unoccupied Germany to whom the buyer has obliged himself to deliver the goods. Here the failure of the seller in the first contract prevents the seller in the second from making delivery. The courts insist on the fulfilment of both contracts through the offering of similar goods as substitutes. Where, however, the class of goods can be produced only in the occupied district or only out of its raw materials, the seller in both contracts

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, July 2

British Market

Home Market Prices. Gross Tons at Works or Furnace

Corrected to Date by Cable

	$	£ s d
Semifinished Steel		
Billets, soft steel	34.00	7 7 6
Sheet bars	34.00	7 7 6
Wire rods	55.32	12 0 0
FINISHED STEEL		
Steel bars, England, ⅝ to 3-inch	46.10	10 0 0
Steel bars, England, ⅝ to 3-inch, for export	43.80	9 10 0
Plates, ship, bridge and tank, England	43.80	9 10 0
Plates, bridge and tank, Scotland	42.64	9 5 0
Beams, England	42.64	9 5 0
Beams, Scotland	42.64	9 5 0
Sheets, black, 24 gage	57.63	12 10 0
Sheets, galvanized, 24 gage	84.13	18 5 0
Rails, 60 lbs. and over	46.10	10 0 0
Rails, 60 lbs. and over, for export	43.80	9 10 0
Tin plate, base box, 108 lbs.	5.30	1 3 0
Steel hoops	55.32	12 0 0
Steel hoops for export	54.17	11 15 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	25.93	5 12 6
Hematite, West Coast, Mixed Numbers	25.93	5 12 6
Basic, Middlesbrough	25.93	5 12 6
No. 3 Foundry, Middlesbrough	26.51	5 15 0
No. 3 Foundry, Derby, Leicester, Nottingham	23.63	5 2 6
No. 3 Foundry, Northamptonshire	23.05	5 0 0
No. 3 Foundry, Staffordshire	23.63	5 2 6
No. 3 Foundry, Scotch	25.36	5 10 0
Ferromanganese, 76 to 80 per cent	82.90	18 0 0
Ferromanganese, 76 to 80 per cent, for export	92.20	20 0 0
COKE		
Yorkshire furnace	6.45	1 8 0
Yorkshire furnace, for export	11.53	2 10 0
Yorkshire foundry	8.07	1 15 0
Yorkshire foundry, for export	11.53	2 10 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	23.29	2,712,000
Foundry, No. 3, Oberhausen	21.43	2,679,000
Bessemer Stahleisen, Siegen	13.55	1,594,000
Foundry, No. 1, Oberhausen	13.60	1,600,000
Luxemburg Foundry	17.22	2,026,000
COKE		
Ruhr furnace	6.18	773,000
Ruhr foundry	6.44	805,000
SEMIFINISHED STEEL		
Billets	30.56	3,820,000
Sheet bars	33.68	4,210,000
Wire rods	32.00	4,000,000
FINISHED STEEL		
Standard rails	37.60	4,700,000
Merchant bars	37.60	4,700,000
Structural shapes	37.60	4,700,000
Ship plates	44.00	5,500,000
Medium plates, 3 to 5 millimeters	24.13	2,839,000
Sheets, below 3 millimeters	62.40	7,800,000
Tin plate		nominal
Plain wire	40.00	5,000,000
Bands and strips	47.20	5,900,000

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	26.58	430
Basic Bessemer, Lorraine	24.11	390
Foundry, Longwy, No. 3, sand-cast	23.49	380
Foundry, Longwy, No. 3, chill-cast	24.11	390
Ferromanganese, 76 to 80 per cent	95.83	1,150
COKE		
French furnace	8.35	135
German furnace, f.o.b. frontier*	11.13	180
German furnace, f.o.b. frontier**	15.46	250
French foundry	8.96	145
SEMIFINISHED STEEL		
Blooms	30.29	490
Billets	32.77	530
Sheet bars	43.28	700
FINISHED STEEL		
Standard rails	34.00	550
Merchant bars	39.57	640
Angles	39.26	635
Normal beams and profiles	39.26	635
Plates, ship and tank, 10 millimeters and thicker	43.59	705
Plates, bridge and tank, 5 to 10 millimeters	44.82	725
Sheets, black, 3 millimeters	47.30	765
Sheets, blue annealed, 2 millimeters	51.31	830
Shafting, cold-drawn, 40 to 60 millimeters	86.56	1,400
Bars, 2 per cent nickel steel	111.29	1,800

All prices are f.o.b. furnace or works.
*Up to 50 per cent of normal requirements.
**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	21.14	400
Basic open-hearth, Belgian	28.80	545
Gray forge, Belgian	14.27	270
Foundry, No. 3, Belgian	23.78	450
Foundry, No. 3, Luxemburg	23.25	440
Foundry, No. 3, Lorraine	23.25	440
SEMIFINISHED STEEL		
Blooms	26.43	500
Billets	28.27	535
Sheet bars	29.60	560
Wire rods	37.52	710
FINISHED MATERIAL		
Standard rails	38.32	725
Merchant bars	30.92	585
Plates, 5 millimeters and thicker	35.41	670
Sheets, black, 3 millimeters	37.52	710
Sheets, galvanized, 1 millimeter	93.81	1,775
Plain wire	59.46	1,125
Galvanized wire	68.71	1,300
Normal beams and profiles	30.92	585
Wire nails	62.10	1,175

All prices are f.o.b. furnace or works.

has a good defense.

"Of importance to German business men is the situation arising out of the boycott of French and Belgian business which was declared when the Ruhr was invaded. Germans who had previously contracted to deliver goods found that they could not, as a rule, obtain export permits. It is not probable that the Belgian and French courts would regard this as a good defense to the nonfulfilments of contracts. German business men consequently expect many judgments against them in Belgian and French courts.

"A practice, sanctioned by the civil code, is growing, of incorporating into contracts especially when they deal with goods coming from the occupied region, or depending for manufacture on its raw materials, a clause which makes it possible to delay the date of the delivery or of acceptance. But German merchants are finding that this practice is hurtful to their foreign trade. Foreign customers want certainty in the date of delivery and while German business houses can often quote lower prices than their competitors, they are in danger of losing ground because of the unreliability of their deliveries."

British Iron Production Shows Gain

London, June 21.—The production of pig iron in Great Britain in May according to the official figures of the National Federation of Iron and Steel Manufacturers was 714,200 gross tons compared with 652,200 tons in April, 633,600 tons in March, 567,900 tons in January, and 407,900 tons in May, 1922. This is the highest monthly output attained since September, 1920, when production amounted to 741,000 tons. There were 223 furnaces in blast at the end of May compared with 216 at the end of April, 202 at the end of March, 183 on Jan. 31, 169 at the end of 1922, and 77 at the end of 1921. The pig iron pro-

PIG IRON

	1923	1922	1921
January	567,900	288,000	642,100
February	543,400	300,100	463,600
March	633,600	389,800	386,000
April	652,200	394,300	60,300
May	714,200	407,900	13,600
June		369,200	800
July		399,100	10,200
August		411,700	94,200
September		430,300	158,300
October		481,500	23,500
November		493,900	271,800
December		533,700	275,000
Total		4,899,500	2,611,400

duction in May included 252,100 tons of hematite, 217,900 tons of basic, 158,800 tons of foundry, and 44,100 tons of forge grades.

The production of steel ingots and castings in May was 821,000 tons compared with 749,400 tons in April, 802,500 tons in March, 634,100 tons in January, and 462,300 tons in May, 1922. This is the highest output since September, 1920, when the production amounted to 884,700 tons and is 10,500 tons more than the monthly average for the year of maximum production, which was 1917.

STEEL INGOTS AND CASTINGS

	1923	1922	1921
January	624,300	327,500	493,400
February	707,100	418,800	483,500
March	802,500	549,400	359,100
April	749,400	404,200	70,600
May	821,000	462,300	5,700
June		400,200	2,700
July		473,100	117,200
August		528,400	434,100
September		555,900	429,300
October		565,200	405,400
November		600,800	443,800
December		546,100	381,000
Total		5,831,900	3,625,800

Details of the pig iron and steel output from January, 1921, to May, 1923, are shown in the accompanying table.

Canadian Pig Iron Prices Are Reduced

Foreign Special Service

TORONTO, Ont., July 2.—The only feature of interest in the Canadian pig iron market is a decline of $2.50 per ton. Prices now quoted by Canadian furnaces are as follows; No. 1 (2.25 to 2.75 silicon) and malleable $34.05; No. 2, (1.75 to 2.25 silicon) $33.05, Toronto; No. 1 and malleable $36.40, and No. 2, $35.40, Montreal. Summerlee and Carron, imported, are unchanged at $40, Montreal warehouse.

Melters still are withholding contracts for the third quarter. Spot demand also is light. Record production in the past two or three months was needed to fill second quarter contracts, but it will be impossible to keep up operations unless business shows a decided improvement.

In the finished iron and steel market demand for practically all commodities is brisk. Structural shapes are moving freely. Numerous sales are being made and while they are for small tonnages, a large order sometimes is closed. Shapes and beams are quoted at 2.70c, Toronto.

A good demand for bars is reported by local mill representatives, and mills at Hamilton are said to have orders on hand sufficient to keep them going for two or three months. Bars are 3.10c, Toronto.

A good volume of plate business continues to come out. The Canadian mills are active, though it is reported that some buying is being done by Canadian consumers in the United States. Plates are quoted at 2.60c, Toronto.

While demand for sheets has fallen off slightly mills are operating at capacity, and have orders sufficient for about six weeks. No. 28 black sheets are 4.60c; No. 10 blue annealed 3.75c, and No. 28 galvanized 6.00c, Toronto.

Trading in iron and steel scrap is quiet. Dealers are offering $16 for heavy melting steel, and $13 for turnings in gross tons, delivered at Hamilton; $18 for steel axles, $21 for wrought iron axles and $13 for boiler plate in gross tons, Toronto. They also offer around $20 per net ton Toronto, for machinery cast and $18 for malleable scrap, stove plate and standard car wheels.

The Detroit Steel Products Co., Detroit, Mich., capitalized originally at $5,000,000, has filed amendments to its articles of incorporation at Lansing, whereby its capital now will be $4,000,000 of preferred ($100 par value), and 250,000 shares of no par value. Of this $2,132,600 in preferred and 142,176 shares of no par value will be exchanged for the preferred and common stock now outstanding.

British Balance of Trade More Favorable

Birmingham, Eng., July 1.—The British board of trade return for May shows a total export of iron and steel products including scrap amounting to 435,630 tons as compared with 398,507 tons in April and 300,981 tons in May of last year. The total iron and steel imports, including scrap for May aggregated 114,132 tons as compared with 133,929 tons in April and 72,427 tons in May of last year.

The details of exports and imports follow.

EXPORTS

	Month ended May 1922 tons	1923 tons
Scrap	28,544	11,121
Pig iron:		
Forge and foundry	17,702	51,705
Acid	22,829	29,410
Basic	1,357	100
Ferroalloys	15,381	11,680
Steel ingots	133	136
Blooms, billets, slabs	642	2,107
Bars, rods, angles, shapes, etc.	17,482	37,132
Castings, iron	36	187
Castings, steel	85	71
Forgings, iron	2	10
Steel girders, beams, etc.	6,038	7,805
Hoops and strips	2,774	5,646
Plates and sheets, not galvanized	.....	.....
Plates and sheets, not under ⅛-inch thick	4,905	17,847
Plates and black sheets under ⅛-inch thick	15,355	32,266
Black plates	5,545	6,106
Plates and sheets, coated,:		
Galvanized sheets	46,258	52,911
Tin plates	39,455	54,059
Cast tubes, pipes and fittings	4,817	9,166
Wrought tubes, pipes and fittings	4,954	15,805
Rails for trams	1,302	4,247
Railway rails	13,063	19,646
Sleepers and fishplates	19,875	10,754
Tires and axles	853	2,384
Wheels and axles	2,327	3,349
Railway material, other types	4,919	3,823
Wire	3,356	8,377
Wire manufactures	2,349	4,327
Nails and tacks	935	1,933
Wood screws	372	344
Bolts and nuts	1,356	2,076
Manufactures of cast iron	1,233	2,711
Anchors, cables and chains	821	1,229
Bedsteads and finished parts	696	1,040
Hollow ware	860	1,574
Other manufactures of iron and steel	11,621	15,095
Total, including scrap	300,981	435,630

IMPORTS

	Month ended May 1922 tons	1923 tons
Pig iron:		
Forge and foundry	1,529	3,660
Acid	.....	.....
Basic	3,329	3,723
Ferroalloys	1,251	2,143
Steel ingots	59	1,373
Scrap	11,488	31,887
Blooms, billets, slabs:		
Iron	1,728	160
Steel	11,198	31,020
Bars, rods, angles, shapes, etc.		
Iron	3,469	7,289
Steel	7,898	6,681
Steel:		
Wire rods	4,585	1,574
Other steel	3,471	4,704
Special steels	104	26
Castings, iron	383	23
Castings, steel	354	445
Forgings, iron	6	36
Forgings, steel	83	91
Steel girders, beams, etc.	2,345	2,993
Hoops and strips	2,102	971
Plates and sheets	2,292	2,157
Cast tubes, pipes and fittings	1,407	1,549
Wrought tubes, pipes and fittings	2,235	1,616
Rails for trams	249	.....
Railway rails	222	698
Tires and axles	2	48
Railway material, other types	621	608
Wire	3,419	1,814
Wire nails, including staples	3,072	3,835
Wire manufactures, other sorts	444	383
Nails and tacks	246	331
Bolts and nuts	326	542
Hollow ware	1,267	398
Manufactures of iron and steel, other sorts	1,216	1,349
Total, including scrap	72,427	114,132

To Build Foundries

Detroit, July 3.—Plans have been completed by the Cadillac Motor Car Co. for the erection of three new foundry units in connection with the main plant of the company here, according to an announcement by H. H. Rice, president. The new foundries will be for the production of gray iron, aluminum and brass castings. Construction of the new units will be started as soon as bids have been received and compiled.

Dismantling Ships

Henry A. Hitner's Sons Co. has leased a large tract at the foot of Spruce street, Delaware river, Camden, N. J., for the storage of old ships which the company purchased for dismantling. The two yards of the company in Philadelphia are working at capacity, cutting into marketable sizes the steel structures.

Stockholders of Columbia Motors Co., Detroit, have approved proposal of directors to reduce the capital stock of the company from $6,000,000 to $3,000,000 and issue stock of no par value instead of the present stock of $10 par value.

Scrap Still Is Falling

(*Continued from Page 6*)

being from 50 cents to $1.50 per ton lower than a week ago and some at least 50 cents lower than quotations of the latter part of last week. In fact, revisions downward are a matter of almost a day's notice in some directions since considerable scrap is coming out and dealers will not pay high prices for the reason the majority of their short sales have been covered. Today they are offering to pay $19 for heavy melting steel; last purchases by them were on the basis of $19.50 to $20. The Midland, Pa., consumer lately has been paying $20.50 for this grade. Users at Monessen, Woodlawn, Aliquippa, Butler and other nearby Pennsylvania points will undoubtedly purchase in July and the Midland user too will return for more tonnage. About 50,000 tons of different grades of scrap are offered by the Pennsylvania railroad in its four lists, bids on which close July 6. About 27,000 tons are involved in the eastern region list, 13,000 in the central, and 10,000 tons each in the southwestern and northwestern lists. Approximately 1000 tons of compressed sheet scrap recently was offered for bids by the Canonsburg Steel & Iron Works, Canonsburg, Pa., and the Westinghouse Electric & Mfg. Co. obtained $18.60 f.o.b. its plant on the compressed sheets it will produce in July.

Market Continues Quiet

Birmingham, Ala., July 2.—The scrap iron and steel market in the South continues quiet. Shipments on old contracts continue and dealers are replacing the stock being moved out. The railroads continue to offer great quantities of old material, unassorted, and complaint of labor shortage still is made. Further weakness is noted in quotations and some changes. Heavy melting steel is steady, the largest consumers buying at practically their own prices. The fact consumers are taking their product on old contracts promptly is encouraging.

Consumer Buying Is Small

Cincinnati, July 3.—Further price declines in several grades have brought the local scrap market to the lowest level of the year. Quotations mean little in the market, which is practically free of large consumer buying. The weakness is due to liberal offerings by railroads and a light buying movement. July promises to be a dull month. Sentiment in the scrap trade here is one of pessimism and dealers predict prices will go lower. Despite the fact new business is scarce, dealers are busy on old contracts and shipments are continually going to consumers. Dealers report no important inquiries. Forwardings from country dealers have been reduced considerably, largely due to the recent heavy price declines. Some of the railroads are offering scrap before the lists go out in an effort to move it quickly.

Price Decline Continues

Detroit, July 3.—Scrap iron and steel prices continue to decline, the average drop being about $1 a ton. Machine shop turnings have declined $2. In recent weeks there has been a large amount of this grade accumulated. Cast borings are not in much demand and producers' yards are well stocked. Malleable is off $1, while automobile cast scrap is down $2 a ton.

However, a more stable market is anticipated soon. Present quotations are the result of recent liberal purchases and from bids. There is some smaller buying, however, at prices under the general market. Slightly lower prices may be looked for during the next few weeks, but it is believed that by the end of the month consumers will be more active in the market.

Few Purchases Made

St. Louis, July 2.—The local market for scrap iron and steel has devolved into a waiting affair, with prices largely nominal. Transactions have been too few to gage accurate prices upon, but on several items dealers have lowered their quotations by 50 cents to $1. Except where material looks unusually cheap, the industries are purchasing nothing, but dealers are picking up fair tonnages of certain grades for stock. Dealers with contracts to fill are rushing deliveries in order to complete their quotas before expiration. Rejections are heavy and some cancellations are reported.

Generally there is a little more optimism among the trade. It is pointed out many melters have let their stocks work to a low ebb, and in order to continue the present pace of operations they must replenish in the near future.

Offerings are not particularly burdensome, especially from the country. Railroads in this region have been marketing less scrap at the recent low levels. Lists before the market include: Kansas City Terminal, 50 tons; Chicago, Milwaukee & St. Paul, 1300 tons; Big Four, blind list; Pennsylvania, southwestern division, 8000 tons.

New Company To Operate Mechanical Puddler

Youngstown, O., July 3.—The American Puddled Iron Co. of this city has been incorporated under the laws of Ohio with a capital of $3,500,000. Edward L. Ford and R. C. Steese are named as principal incorporators. The new company will take over and operate the mechanical puddling plant now being erected near Warren, O. by the Youngstown Steel Co. The plant will be ready to operate about Oct. 1 and will cost $2,100,000 when completed.

A proposal for financing, which will be submitted to stockholders on July 27, includes an exchange of the common stock of the Youngstown Steel Co. for that of the American company. An issue of $1,500,000 preferred stock also will be authorized.

Great interest is attached to the operation of the plant which will put in practical use the mechanical puddler invented by Mr. Ford, who is a son-in-law of Joseph G. Butler Jr., pioneer of the iron and steel industry of the Mahoning valley.

Machine Company Twenty-One Years Old

June 25 marked the twenty-first anniversary of the starting of the Alliance Machine Co., Alliance, O. The company first began its operations with six pieces of equipment for the production of cranes but the business has grown to such an extent that today the plant comprises hundreds of machines.

The company was first incorporated with a capital stock of $100,000. The officers when organized were W. C. Whitehead, president; W. H. Purcell, general manager; G. W. Shem, secretary and M. S. Melbourne, treasurer. Three years later Mr. Purcell became president of the new organization and has remained at its head during the years of growth. Mr. Shem retired from the company six years ago and at the present time Mr. Melbourne is vice president, secretary and treasurer.

The growth of this company and allied interests has been so great that at present the capital stock is $2,100,000. The pay roll of the organization in a month is greater than the original capital stock, ranging from $130,000 to $150,000. When the industry started operating it employed 118 men. At present when running at full capacity 1500 men are employed.

Car & Foundry Net Up

The net profits of the American Car & Foundry Co., for year ended April 30, 1923, after expenses and federal taxes, amounted to $10,633,562 against $9,051,721 in the previous year. After all charges and deductions there remained a balance of $6,213,611 for common and preferred stocks, against $6,583,320 the year before. After payment of 7 per cent on preferred and 12 per cent on common there was $513,611 left to be added to profit and loss surplus, bringing that item up to $36,673,499.

Peat Industry Larger

Washington, July 3.—Substantial progress was made by the peat industry in the United States in 1922, according to statistics compiled by the geological survey, department of commerce. The quantity of peat produced in 1922 was nearly 100 per cent more than that in 1921, the output of the former reaching 60,680 short tons as compared with 30,406 short tons for the latter. Twenty-three plants reported production in 1922, or two more than were in operation in 1921. The bulk of the production for both years was consumed in fertilizer and fertilizer ingredient.

Steel & Tube Purchase Is Finally Closed

Youngstown, O., July 3.—Purchase of the Steel & Tube Co. of America properties by the Youngstown Sheet & Tube Co. has been completed, according to official announcement by President J. A. Campbell. As a consequence W. C. Reilly, general superintendent of Youngstown Sheet & Tube Co. has taken charge of all operations of the new western properties of the company situated at Indiana Harbor and South Chicago, Ill., Evanston Ill., Mayville Wis., Zanesville O., and Kalamazoo Mich.

While plans for improvement of the properties have not been definitely announced Mr. Campbell intimated that as soon as expedient a new modern blast furnace will be built at the Mark plant at Indiana Harbor. Construction of the stack which is to furnish hot metal to the open-hearth furnaces and bessemer converters may be started this year. A careful survey will be made of all the properties and about $10,000,000 is expected to be spent to make operation more economical.

Sale of the Mayville mine on the Gogebic range and furnace property at Mayville, Wis. and the Harrow Spring Works at Kalamazoo Mich. was also forecast by Mr. Campbell.

Several important changes in the personnel of the Sheet & Tube Co. will be made in the near future, it is said.

"Youngstown Sheet & Tube is essentially a steelmaker and steel finisher and does not care to go deeper in the pig iron business," he said. "We may sell all those properties of our acquisition, which are not in line with our usual activities."

The purchase of the Steel & Tube company properties makes the Youngstown independent the third largest steel company in the United States with an annual ingot capacity of 3,060,000 tons, and among the independents it will stand second to the Bethlehem Steel Corp. It will be the largest producer of steel tubular goods and is now the second largest independent producer of sheets.

The transaction was financed through a loan of $40,000,000 advanced by a bankers syndicate and which amount will be raised through the public offering of 20 year 6 per cent debenture bonds. The cash consideration in the deal was more than $33,000,000 and it was paid by one check signed by Mr. Campbell. In addition of the cash payment the Sheet & Tube company assumed all bonds outstanding and secured by mortgage on the western properties. The bonds total about $23,000,000 making the total purchase price of the new acquisition about $57,000,00.

Prospects of an appeal and further attempts of litigation by minority stockholders of Steel & Tube Co. of America was taken in consideration by Sheet & Tube company directors before the purchase was closed. No fear of future trouble on this account was expressed.

Government Drops Coal Case Indictments

Indianapolis, Ind., July 3.—Indictments returned in February, 1921, against 226 coal operators and mine workers' officials, charging conspiracy to violate the Sherman antitrust law, were dismissed by Judge A. B. Anderson in United States district court here June 28, on motion by Attorney General Daugherty. Mr. Daugherty said " a verdict of not guilty would be the inevitable result of the trial of this case." Further he stated to the court:

"I have no hesitation in saying that usually many of the things agreed upon at meetings between representatives of the operators and representatives of the miners, but not often made public, constitute a conspiracy. The public is fed up with the idea that there is a great and stubborn controversy between the contracting parties when, in fact, there is no real contest at all and the fake pretensions are intended only to alarm the public so that it will consent to give any price for coal to be insured against freezing.

"Fair and lawful agreements must be entered into hereafter, and the things complained of in the indictments in this particular case must be discontinued."

The court action followed conferences between Daugherty and the federal coal commission, aimed to restore peace in the bituminous coal industry.

Air Brake Sales Large

The New York Air Brake Co. reports net sales of 4,493,120 for the five months ended May 31, 1923. Net earnings after interest charges and all other expenses were $1,292,085. The general balance sheet on May 31 showed net current assets of $7,773,909 and net current liabilities of $1,041,493, leaving working capital of $6,732,416, against working capital of $5,588,156 at the close of 1922.

J. C. Haswell president of the Dayton Malleable Iron Co., Dayton, O., has purchased the entire interest in the company formerly owned by Thomas P. Gaddis and his family. Mr. Gaddis had been associated with the company for 51 years.

Lake Steamer Named for Schwab Launched

Charles M. Schwab, chairman of the Bethlehem Steel Corp., attended the launching of a Great Lakes freighter named in his honor, at the yards of the American Shipbuilding Co., Cleveland, Saturday, June 30. The steamer CHARLES M. SCHWAB was built for the Interlake Steamship Co., Pickands, Mather & Co., managers, and will be completed and ready for service by Aug. 10. The boat is 600 feet over all, 580-foot keel, 60-foot beam, and 32 feet deep. It is practically a duplicate of the steamers JOSHUA A. HATFIELD and RICHARD V. LINDABURY of the Pittsburgh Steamship Co., recently built at the Lorain, O., yards of the shipbuilding company.

Mrs. Eurana Neeland, niece of Mr. Schwab, christened the boat.

Pipe Long in Service

Data gathered by the Cast Iron Pipe Publicity bureau, Chicago, on the life of cast iron pipe in municipal water distribution, reveal the fact that some pipe laid in Philadelphia in 1801, 122 years ago, is still in use. According to the bureau's records, pipe laid in Pittsburgh in 1824, in Baltimore in 1829 and in New York in 1832 also still is in service. In the nine cities canvassed all have been using steel pipe for from 68 to 122 years.

Coke Exports Increased

Washington, July 3.—May exports of coke from the United States amounted to 163,249 tons valued at $1,816,332, many times the 21,798 tons valued at $201,124 shipped out in May, 1922, the department of commerce states. In the months ended with May, coke exports totaled 901,037 tons valued at $9,965,197; in the same 11 months of 1921-22 they aggregated 268,341 tons valued at $2,348,259. At this time last year the bituminous coal strike was on.

Issues Stock Bulletin

The first number of the *Surplus Steel Exchange* published by the Surplus Steel Exchange, Inc., 7 Dey street, New York, has been issued. The new bulletin lists material in various forms of steel available for immediate shipment. Other announcements of interest to buyers and sellers of surplus lots of steel are contained. The Surplus Steel Exchange, Inc., recently was organized as an agency for merchandising surplus lots of steel which have accumulated in the hands of users or producers.

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1922 Good Production Year

MORE steel was made and rolled into finished forms in this country in 1922 than in any year before the war. This is the interesting story told by the official figures of production in 1922 issued by American Iron and Steel institute. The total output of steel ingots and castings in 1922 was 35,602,926 gross tons. This exceeds the prewar peak of 31,300,874 tons in 1913 by 4,302,052 tons or 13.7 per cent. During the war last year's total was exceeded in three years, 1916, 1917 and 1918 and only once since, in 1920. Yet 1922 was not a period of prosperity for the steel industry and in point of profits and operations was decidedly unsatisfactory notwithstanding the fact that the output registered a gain of 80 per cent over the extreme depression period of 1921. These facts tend to emphasize how greatly steel capacity has increased since 1913 and what a tremendous volume of demand is required to produce favorable business conditions in the industry.

Some interesting changes in the relationships of individual finished products to the total finished rolled output of 26,404,002 tons are shown The production of rails in 1922 actually was less in tonnage by a slight margin than in the acute depression year of 1921.

Merchant bars contributed 15.07 per cent of the total compared with 10.59 per cent in 1921 and 20.75 per cent in 1920; structural shapes, 10.29 per cent which compares with 8.61 per cent in 1921 and 10.20 per cent in 1920; plates, 9.16 per cent against 11.23 per cent and 14.60 per cent in the two preceding years respectively; tubular goods, 10.34 per cent against 13.42 per cent and 9.28 per cent; wire rods, 10.05 per cent against 10.59 per cent and 9.69 per cent; sheets, 17.41 per cent against 10.23 per cent and 9.75 per cent. Notable records were made in 1922 by concrete bars with 575,816 gross tons and cast iron pipe and fittings with 1,283,449 net tons. These were the highest outputs of these products in history.

The Steel corporation lost ground in the 1922 production of steel as compared with 1921. Last year its portion of the steel ingots and castings produced constituted 45.2 per cent compared with 55.4 per cent in 1921 and 45.8 per cent in 1920. In finished rolled steel, the largest interest produced 44.6 per cent of the 1922 total. In 1921, it ran up to 50.5 per cent, an extraordinary showing and in 1920 its proportion was 41.6 per cent. The 1922 percentage was exactly the same as in 1915 and 1919 which was about normal for the past ten years.

Results of Depression Shown

THE National Bureau of Economic Research has just published the results of a study by Dr. Willford I. King on the subject of employment in prosperity and depressions, undertaken at the suggestion of the President's conference on unemployment. This study, which is the result of extended research and wide investigations, gives a picture of the effect which the depression of 1921 had upon employment and manufacturing activities. It shows that about one-seventh of all the workers in the country were idle during the dullest part of 1921.

Most of those at work put in full time but there was a sufficient number of part-time workers to reduce the total number of employment hours to about one-sixth. This means that industry during the worst of the storm of deflation still maintained an activity nearly 84 per cent of what it had been in 1920. This is in accord with the prevailing belief among economists that the rise or fall of industry is never more than 15 or 20 per cent above or below the normal line. Mass consumption of goods varies much less than this, probably not more than 5 or 8 per cent. That is why shortages appear during depressions and provide an impetus which accelerates the later rate of recovery as in 1922 and 1923.

Dr. King's research developed many other interesting facts. One of these is that the falling off in employment was confined mainly to construction,

manufacturing, mining and transportation industries. In all other fields, the depression apparently caused but little change in the total number at work.

Another important and thought-provoking discovery is that the tendency to lay off employes was much stronger in large industries than in small ones. At the lowest point of the cycle, companies employing fewer than 21 employes had reduced their total labor force by only 3 per cent; those hiring from 21 to 100 employes had lessened the number of hours worked by nearly 14 per cent; and enterprises hiring more than 100 employes had cut down their volume of employment by more than 28 per cent. It thus appears that the man who worked for a big company was nine times more likely to lose his job than was the man working for a very small enterprise. This seems to strike down the theory that better organization resulting from the advent of large-scale industry automatically would result in the stabilization of employment.

During 1921 total payments of salaries and wages in the United States amounted to $32,596,000,000, of which approximately one-third was paid out by enterprises hiring fewer than 21 persons, and one-half by persons hiring more than 100. During the first quarter of 1922 salary and wage payments were less by $2,729,000,000 than were the total disbursements in the third quarter of 1920. The study further shows that the average annual earnings for persons working in plants employing more than 100 persons amounted to $1544. In 1921 because of unemployment, their earnings had fallen to $1112, a loss of $432. Those employed in enterprises having fewer than 21 employes, received only $1121 each in 1920 but in 1921, their earnings had declined only to $1077, a dimunition of $44. It would appear from this that in large organizations the risks for the individual are greater than in the smaller ones. Doubtless this is offset by the greater opportunity.

Commission's Rulings Are Extreme

IN REFUSING the Virginian railroad permission to construct one mile of main track to a new bituminous coal mine in West Virginia the interstate commerce commission declared that "there are at present more mines in the country than is consistent with the efficient use of carriers' equipment and their aggregate car supply." As a statement of fact and an economic argument this is undoubtedly true, but the commission's action is questionable.

Following the commission's logic to a tenable conclusion, the construction of a mile or two of track—merely a switch—to a new steel plant might be forbidden on the ground existing steel plants are sufficient to meet all steel requirements. A branch line to a new elevator in the Dakota wheat belt could be estopped because the aggregate storage capacity of all elevators in the United States already exceeds the normal need.

Here is regulation of industry with a vengeance, an extreme to which even the federal trade commission has not yet gone. The commission has arrogated to itself the authority to determine exactly when the upbuilding of an industry shall cease, a restriction surely never dreamed of by the authors and menders of the interstate commerce act. Certainly the requirement by the Cummins-Esch act of a certificate of "public convenience and necessity" precedent to main-line construction has been over-interpreted by the commission.

In deciding the so-called assigned coal-car case the commission also has taken a drastic stand, so drastic that four of the eleven members of the commission have dissented strenuously. Hereafter in distributing coal cars the railroads must include in the general allotment all private-owned cars and cars assigned for railroad fuel. The mines and the industrial plants owning their own cars will no longer receive the full advantage of their investment; in fact, they will be increasing the supply available to their competitors. The assigned car decision, like the construction prohibition, doubtless will find its way to the courts and the cool judgment of the federal bench may overturn the hot-weather fiat of the commission.

Joins Conception and Execution

THE Penn Seaboard Steel Corp. as reported in the news columns of a recent issue of IRON TRADE REVIEW, has joined the increasing number of companies in the steel industry, generally, which realize the the importance of a closer relationship toward the conception and determination of company policies on the part of the individuals who execute them. The directorate of this company now includes no less than seven executives and department heads. The United States Steel Corp. and many other companies have taken action of this kind in the last few years. In fact, there is a pronounced tendency to get away from the old policy of composing directorates of the larger stockholders, an attorney or two and a number of men of outstanding prominence in the financial world.

One result of the appointment as directors of men who actually are directing the company's affairs, has been to eliminate the perfunctory character which characterized many directors' meetings in the past. Meetings of directors who actually direct company's business are unhampered by lack of familiarity with details which naturally must handicap an outside viewpoint. The stimulation of directorates in this manner is only a part of the general disposition to promote closer co-operation and more effective teamwork in industry generally. As such it is to be encouraged by those companies which would secure the best results under presentday conditions.

Strength Lacking in Markets

Financial and Commodity Markets Display Weakness As the First Half Closes— Decline in Stocks Wipes Out All Gains since Spring of 1922— Freight Traffic Huge, Car Shortage Disappears

BY JOHN W. HILL, FINANCIAL EDITOR

FINANCIAL and commodity markets ended the first half of 1923 under considerable pressure. Extensive declines have marked the stock market. Wheat and cotton have fallen. Pig iron is weaker. Copper continues dull. These descriptions apply to nearly all important commodities. They reflect the prevailing business uncertainty, the extreme of caution and the appearance of some overproduction in a few lines. They do not reflect any fundamental weakness in the industrial structure which might lead to severe decline.

The recent happenings in Wall street have contributed to the general uneasiness. As shown by the Business Trend, industrial stock averages have declined to the lowest point in a year. Values have come down from 15 to 30 points, wiping out all the gains since the spring of 1922. Last week issues of leading steel companies suffered greatly. Some of them now are more than 20 points below the year's highest. The decline has been brought about by some uncertainty in the outlook, by the failures of Wall street houses, and by the adverse European situation. The shadow of the Ruhr deadlock is deepening as time goes on and Germany's economic power progressively weakens.

One important development recently has been the announcement of an advance in prices of from $25 to $75 on three types of cars by the Studebaker Corp. Higher automobile values at this time have not been expected, although it is known that rising costs have narrowed the margin of profit for numerous companies. Automobile output continues heavy, but considerable curtailment of activities is expected during the summer. If price advances are made by other companies it will indicate a stronger underlying position of the automobile industry than some observers believe now exists.

No serious letdown in trade is to be deducted from the continued heavy freight movements. As shown by the Business Trend car loadings for the week ended June 16 crossed the million mark for the third time this year. They did this only twice at the peak of last autumn's traffic. At that time the daily average net shortage of cars reached a peak of 170,000. As a result many business students regarded the almost certain possibility of a freight congestion this year as one of the main obstacles in the path of recovery. Instead of a shortage the railroads are handling the unprecedented spring traffic with a surplus which reached 38,000 cars in the second week of June.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	Average 1913
Business failures	292	320	247	364	300
Cash ratio Fed. Res. System	76.9	77.6	76.1	75.5	...
Loan rate, 4-6 Mo. N. Y. (per cent).	5	5	5-5¼	4	5¼-6
Aver. 25 ind'l shares	$100.64	$105.75	$108.54	$199.06	$58.19
Aver. 25 rail shares	$56.52	$61.43	$60.58	$63.72	$82.95
Av. 40 bonds	$76.14	$76.91	$77.72	$79.95	$93.00
Car loadings (week ended June 16)	1,007,253	932,041	991,797	860,907	$942,851
Bank debits 244 cities (000 omitted)	$9,401,212	$10,337,080	$7,815,492	$8,889,424	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	June 30 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.58	$4.61	$4.62	$4.42
Francs	19.3c	6.04c	6.19c	6.47c	8.39c
Lira	19.3c	4.40c	4.49c	5.58c	4.70c
Marks	23.8c	0.0005c	0.0009c	0.0012c	0.25c

MONTHLY COMPARISON

	May	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$380,719,000	$358,693,000	$362,590,000	$71,450,000
Business failures:				
Number	1530	1520	1960	1336
Liabilities	$41,000,000	$46,991,941	$44,403,000	$22,723,000
Exports	$319,000,000	$325,449,000	$307,568,000	$207,000,000
Excess of gold imports	$44,531,887	$8,533,000	$5,587,299	†$630,716
Bureau of Labor Price Index	156	159	148	100
Bradstreet's Price Index	144.3	147.8	128.8	100
Economist's British Price Index	4412	4440	4372	2717
Cost of Living Index	160.3	159.1	154.9	100
New incorporations	$817,229,000	$1,006,258,000	$938,195,000	$172,301,000
Railroad net earnings	*$83,197,800	$83,568,000	$49,919,000	$59,900,000

*April. †Monthly average excess exports.

The Business Trend

July 5, 1923

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Business enters midyear under some uncertainty, but with good prospects for upturn in activity following summer lull; inventories are not heavy and production is being curtailed where it was becoming excessive; consumption heavy; prices continue gradual recession.

BUILDING COSTS—Index of cost for all building materials in May showed slight decline; level now 102 per cent above 1913; structural steel price 78 per cent above 1913.

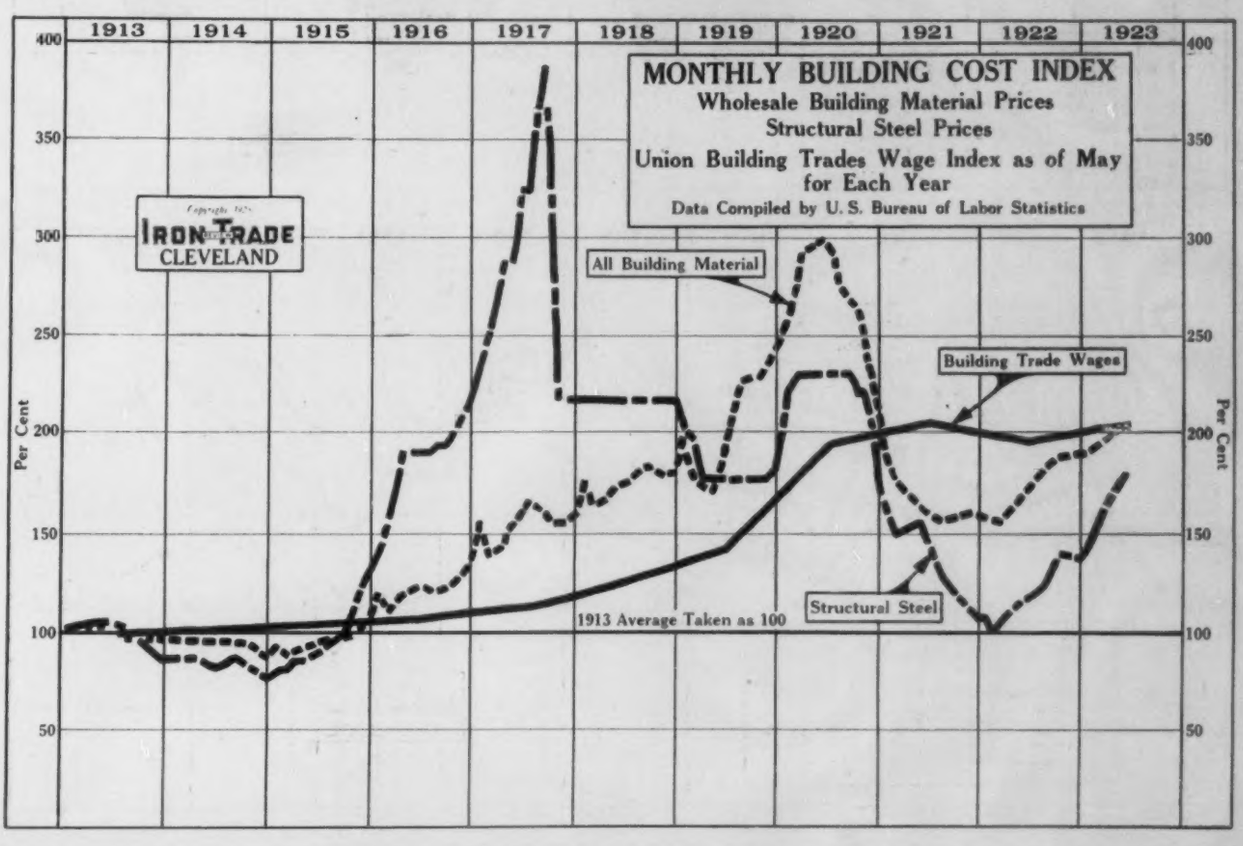
TRAFFIC—Car loadings cross million-mark in week ended June 16 for third time this spring; this happened but twice at peak of last autumn's freight movements; trade activity shown.

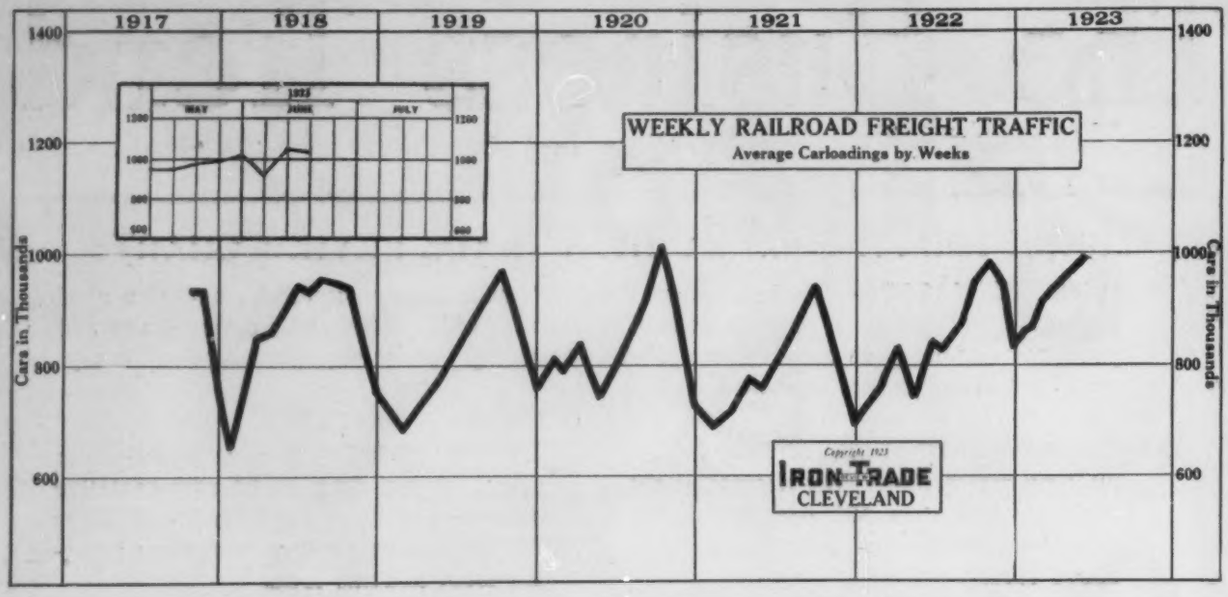
CAR SHORTAGE—Railroads continue to handle remarkable traffic volume without congestion; daily net surplus for week ended June 15 totaled 38,000; roads rushing cars to crop centers.

SECURITY PRICES—Drastic reaction in shares causes drop of 25 representative industries of 17 points from March high; 25 rails down only 10 points; some recovery from extreme lows.

FOREIGN EXCHANGES—European currencies remain weak as Ruhr deadlock continues; Sterling declined to 13 cents below February peak; marks near vanishing point.

COPPER—Copper market continues weak; reflects large production, heavy imports and reduced European buying power; Copper Export Association disposes of last of surplus.

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1920
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1200
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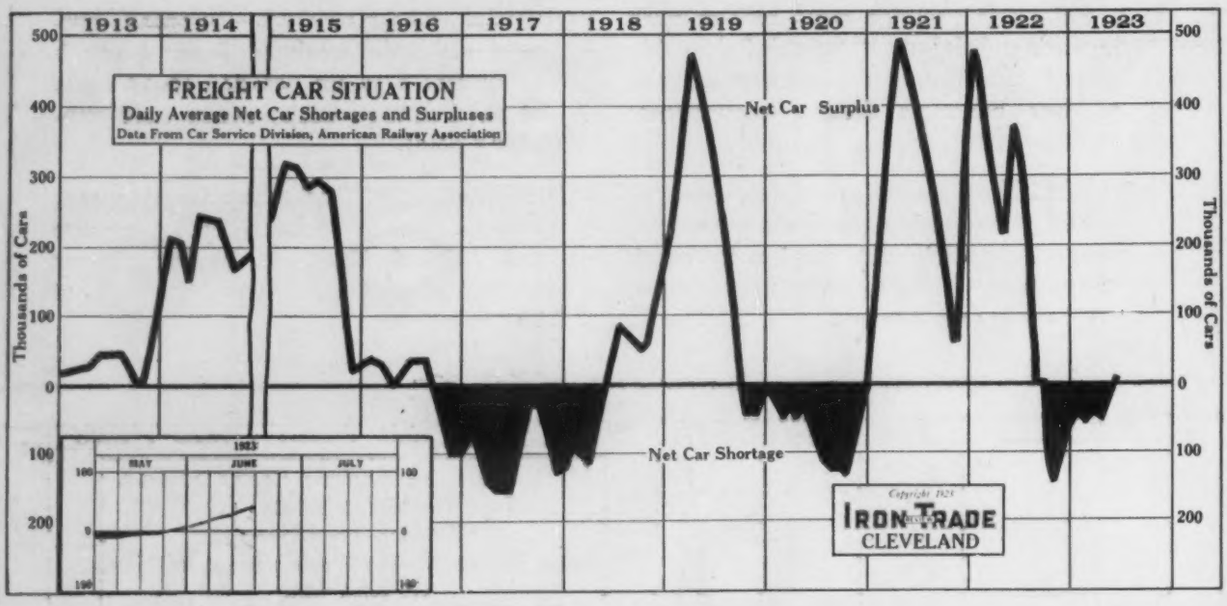
800
600
Cars in Thousands
1923
MAY
JUNE
JULY
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
Copyright 1923
IRON TRADE
CLEVELAND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500
400
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200
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Thousands of Cars
FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
1923
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JULY
Copyright 1923
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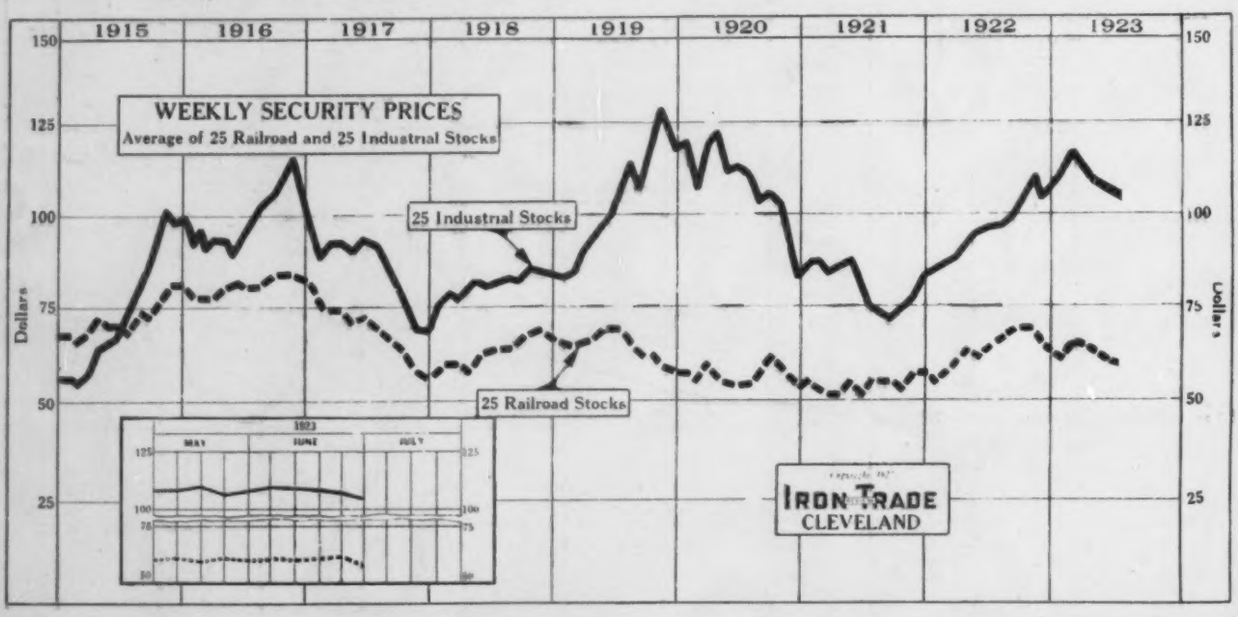
CLEVELAND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150
125
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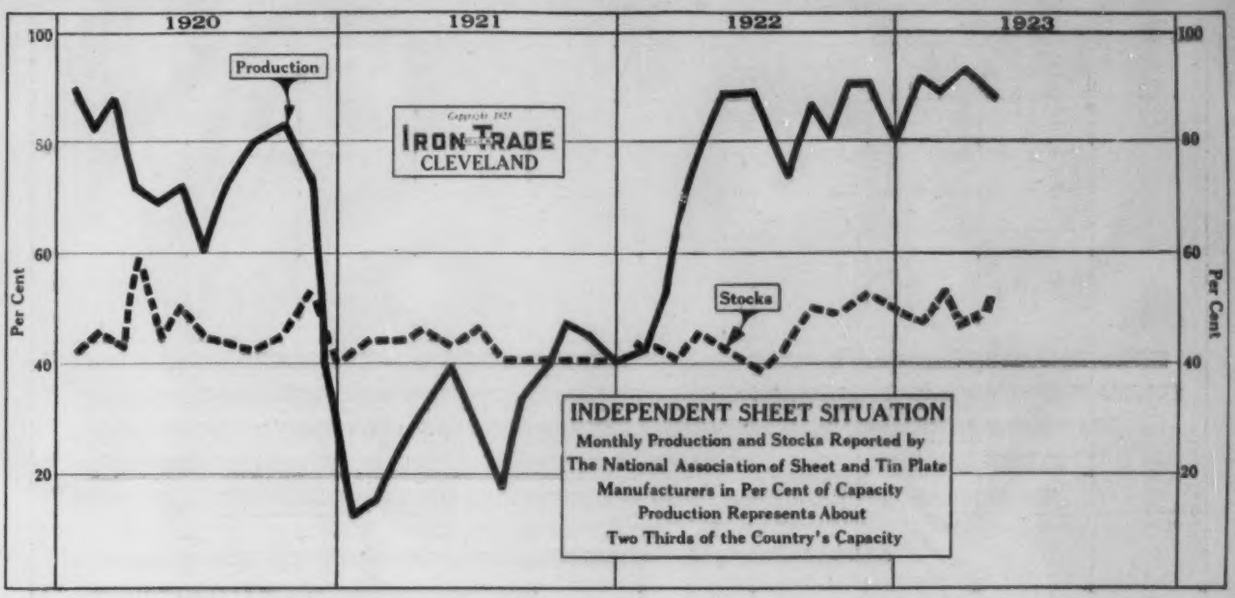
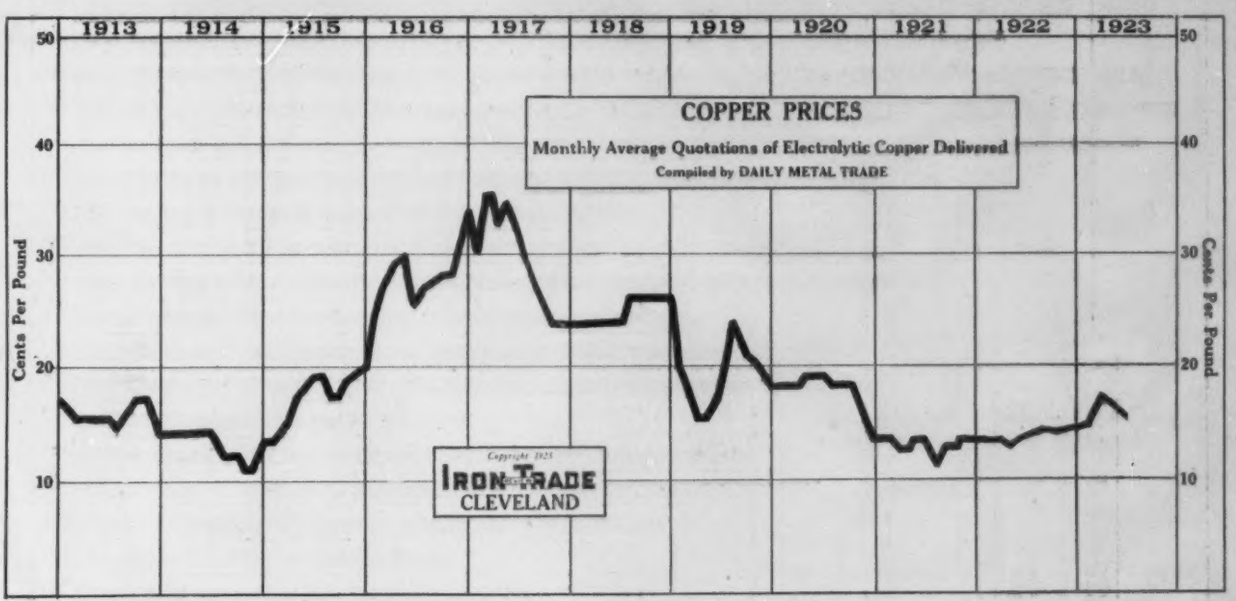
Dollars
WEEKLY SECURITY PRICES
Average of 25 Railroad and 25 Industrial Stocks
25 Industrial Stocks
25 Railroad Stocks
1923
MAY
JUNE
JULY
IRON TRADE
CLEVELAND


1920
1921
1922
1923
Production
Stocks
Per Cent
IRON TRADE
CLEVELAND
INDEPENDENT SHEET SITUATION
Monthly Production and Stocks Reported by
The National Association of Sheet and Tin Plate
Manufacturers in Per Cent of Capacity
Production Represents About
Two Thirds of the Country's Capacity


1913
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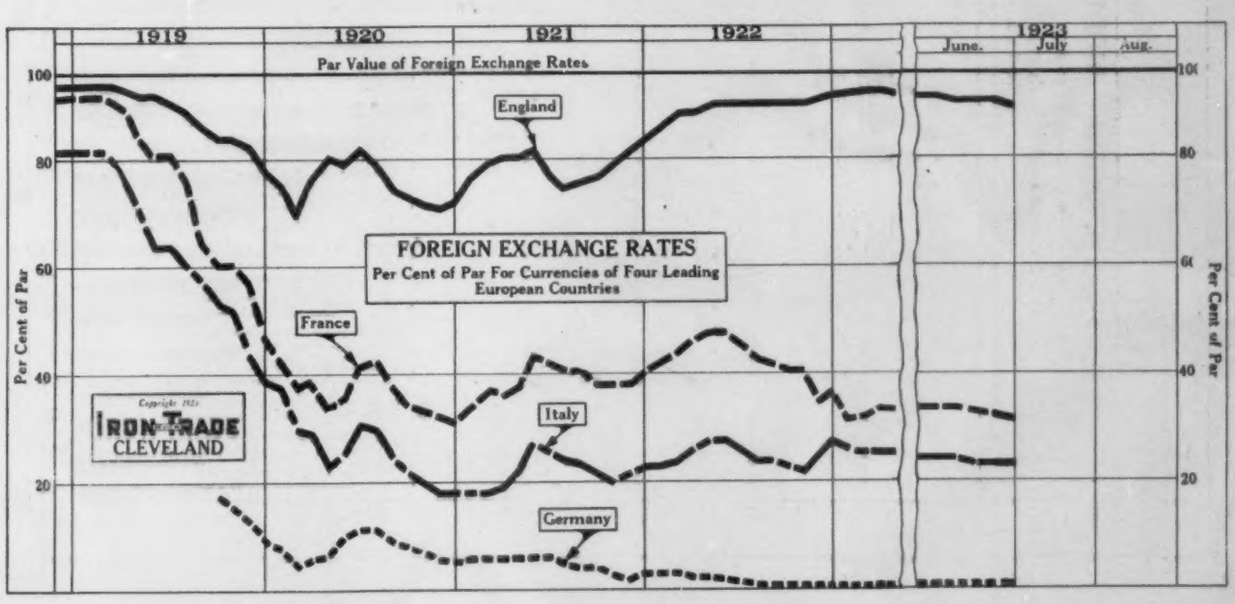
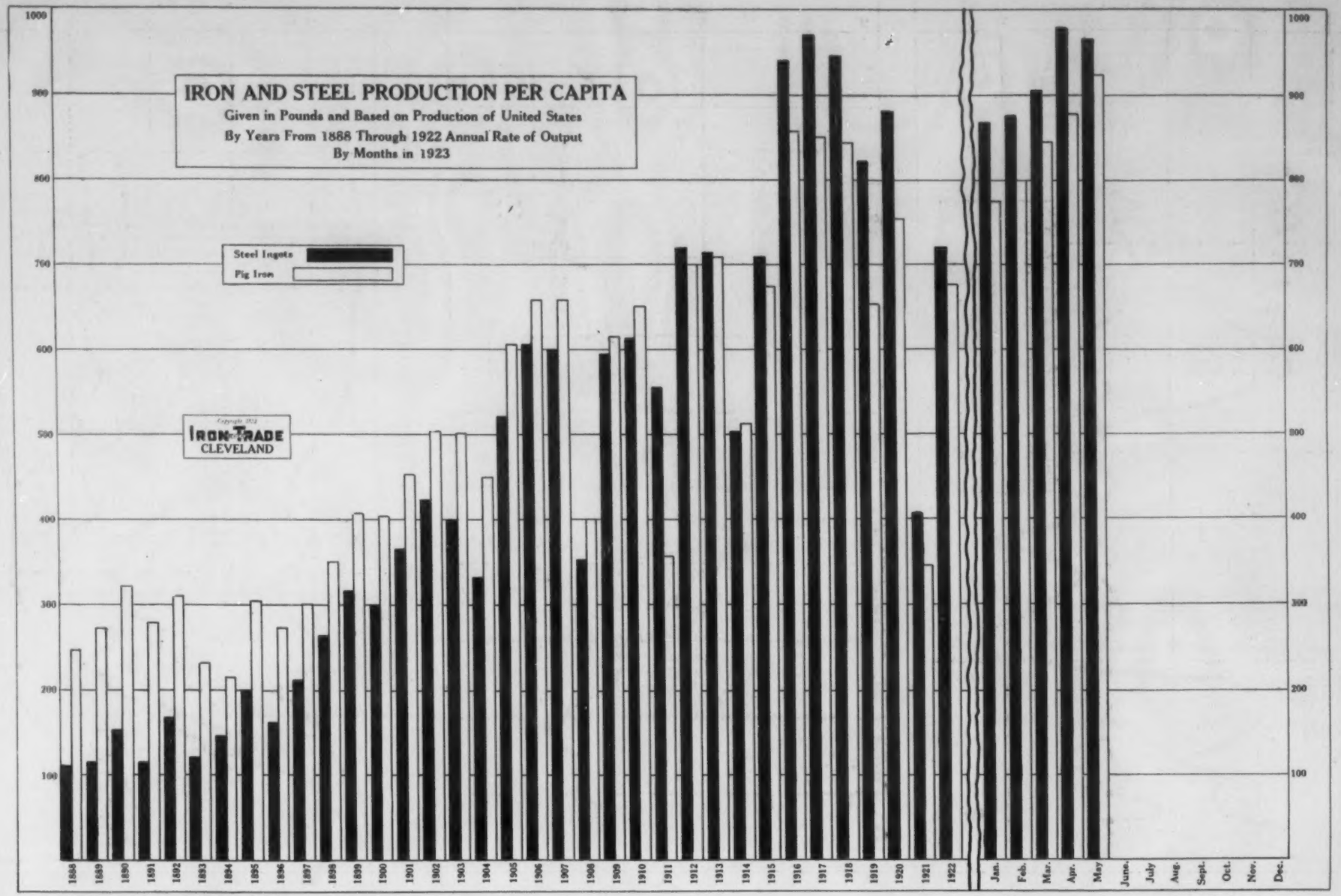
COPPER PRICES
Monthly Average Quotations of Electrolytic Copper Delivered
Compiled by DAILY METAL TRADE
Cents Per Pound
IRON TRADE
CLEVELAND


1919
1920
1921
1922
1923
June.
July
Aug.
Par Value of Foreign Exchange Rates
England
France
Italy
Germany
FOREIGN EXCHANGE RATES
Per Cent of Par For Currencies of Four Leading
European Countries
Per Cent of Par
IRON TRADE
CLEVELAND


IRON AND STEEL PRODUCTION PER CAPITA
Given in Pounds and Based on Production of United States
By Years From 1888 Through 1922 Annual Rate of Output
By Months in 1923
Steel Ingots
Pig Iron
IRON TRADE
CLEVELAND
1000
900
800
700
600
500
400
300
200
100
1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Carbon Affects Chromium Steels

Difficult To Form Definite Conception of Quantitative Effects of Chromium on Physical Properties of Steel Due to Continued Variation in Amount of Carbon Present —Mechanical Qualities Altered by Presence of Chromium

BY CHARLES R. AUSTIN

THIS paper is a record of the effect of heat treatment on the mechanical properties of a series of chromium steels consisting of two groups of steels containing about 0.35 per cent carbon and 1 per cent carbon respectively, the chromium content varying from 2 to 12 per cent. The most extensive examination of the mechanical properties of chromium steels yet published has been given by Sir Robert Hadfield, who includes an excellent historical survey of the researches on chromium alloys with iron conducted previous to his paper. A review of this and of later work has recently been given by C. A. Edwards. In the paper by Hadfield, which is most closely connected with the present record, the samples were made by adding varying quantities of ferrochrome to good wrought iron scrap melted in clay crucibles. The ingots after pouring to the dimension of 2½ inches square were afterwards reduced by cogging and rolling to bars 1⅛ inch diameter. He found difficulty in obtaining sound castings due to honeycombing, and therefore added small quantities of aluminum and silicon. In all cases the carbon content was kept as low as possible, but as the chromium content was increased so also was the carbon content, by virtue of the fact that the ferrochorme used contained 6 per cent carbon. The chromium contents of the sample range from 0.2 to 16.3 per cent, the former having as little as 0.2 per cent carbon while the latter reaches the high value of 2.12 per cent carbon.

As is realized by the author of that paper it is difficult to form a definite conception of the quantitative effects of the element chromium on the physical properties, due to the continued variation in the amount of carbon present. With regard to annealing, it is not to estimate the value of the physical data produced for the treated specimens. As no details are given of the manner of operation it can only be presumed that all bars were heat treated alike in which case a given treatment which would prefectly anneal one sample would certainly not produce the desired effect in all samples It is also now well known that the rate of cooling is a factor of paramount importance indeed. The high sensitivity of the properties of chromium steels to the rate of cooling was even then realized by Arnold, as shown by his contribution to the discussion on the paper.

The two groups of chromium steels used in the present work contain but small percentages of foreign elements and their analysis is given in Table 1. As already mentioned the samples may be regarded as consisting of two groups one with 0.35 per cent carbon and the other with about 1 per cent carbon. In the second group the amount of silicon present is low, and nearly constant except in samples G, H and I; whereas in the first group there is a small progressive increase in the amount of this element.

Preparation of Specimens

All the samples were originally in the form of 1-inch square rolled bars, and specimens of 5½ inches length were cut and prepared for tensile tests. The initial preparation of the specimens in the lathe was a matter of some little difficulty and patience, particularly in regard to the lettered series, where B and C necessitated a very frequent grinding of the cutting tool. H and I were also very hard.

The usual form of test piece was employed. The head was left square, the remaining portion of the metal being turned cylindrically in the usual manner, with a full 2-inch length of about 0.56 inch diameter, thus giving a cross sectional area of ¼ square inch. Pips were punched for a 2-inch elongation determination, and also for an observation on the elastic property.

The condition of the steels previous to annealing was as received, and being in the air cooled condition after rolling may be regarded as semihardened. A complete batch of the steels containing one of each of both series was annealed in a gas fired muffle at 805 degrees Cent. They were placed lengthwise in the furnace and tightly packed with silver sand to keep down oxidation to a minimum and to allow a thorough annealing, the temperature being taken on a thread recorder, with use of a platinum-rhodium thermocouple. The time taken to heat up was 4 to 5 hours, and soon after the temperature desired was attained the furnace was turned off and the steels left undisturbed until the following day.

Even though tightly packed, a certain amount of oxidation had taken place, and the sand had also fritted on to the steels, which were cleaned and prepared for the 2-inch tensile test. Unfortunately, it was not possible to fit an extensometer in order to determine the yield point accurately as the specimen did not give sufficient clearance between the pips and the grips in the machine, and the necessity for economy in use of the material prevented allowance being made for this factor.

Accordingly, the rough "dividers method" was employed conjointly with observations on the drop of the beam. In many cases the values of the yield point obtained are to a certain extent arbitrary to, say 2 to 3 tons per square inch, owing to the difficulty encountered in deciding exactly just when the yield point was reached. This is due to the fact that these alloys do not exhibit the proportionality between stress and strain, according to Hooke's law, up to a certain point, followed by the usual more or less sudden increase in strain with the further application of but little stress, as in the case of an ordinary mild steel.

Table II shows the values obtained on the ¼-inch specimens calculated to tons per square inch.

No yield point was noted for sample 1, and that recorded for sample 2 is not satisfactory, as no definite fall of the beam could be discerned, and only a gradual elongation noted by use of the dividers. At this point it was decided to take as the yield point that tonnage at which one point of the dividers had just crept out of one of the pips. This method of observation was not required in some cases, as the yield point was at times noted with considerable precision by a sudden fall of the beam. The exact behavior of all specimens during the tests was carefully recorded, but as nothing of importance is contained therein, this will not be referred to.

A further batch of chromium steels was subjected to a similar annealing at 850 degrees Cent. and, after cleaning, their mechanical properties examined. The yield point, tensile strength and elongation are shown in the same table. It was then decided to examine the effect of annealing the specimens at a much higher temperature, namely, 960 degrees Cent., and this necessitated the heat treatment being applied to the two series of steels independently, as this temperature could be reached only in one of the small gas fired muffles. The two groups were subjected, however, to an almost identical annealing, a slow raising of the tempera-

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From a paper presented before the London meeting of the Iron and Steel institute, May 10-11. The author is associated with University college, Swansea, Wales.

Table I

Chemical Composition of Samples Used

Sample No.	Chromium, per cent	Carbon, per cent	Silicon, per cent	Manganese, per cent
1	1.96	0.33	0.05	0.13
2	4.02	0.30	0.15	0.17
3	6.18	0.37	0.32	0.23
4	8.08	0.43	0.43	0.25
5	10.39	0.37	0.50	0.19
6	12.08	0.38	0.58	0.24
A	2.08	0.87	0.18	0.19
B	2.09	1.0	0.17	0.29
C	2.11	1.26	0.18	0.20
D	4.19	0.95	0.22	0.10
E	3.92	1.09	0.27	0.18
F	5.07	1.07	0.19	0.21
G	6.16	0.97	0.31	0.14
H	8.12	1.02	0.37	0.10
I	10 42	1.14	0.46	0.07

ture of the silver-sand packed muffle followed by an overnight cooling. The last three columns in Table II indicate the properties for this temperature. In this batch it was particularly difficult to decide on the load to take as representative of the yield point, especially in a few of the lettered samples.

Experiment in Quenching

Mechanical properties of quench specimens followed by tempering were then examined, each sample being given a separate heat treatment and subsequent quenching. The method adopted to effect quenching was as follows. One specimen at a time was heated in an electrically heated vertical tube furnace and was suspended by a length of nickel chrome wire attached to the head of the sample, the former resisting serious oxidation in the furnace atmosphere and retaining its toughness. The furnace itself was a nickel chrome wound silica tube. In actually carrying out a quenching the current was turned on, with the external resistance adjusted for a maximum temperature of 960 degrees Cent., in the furnace. When this temperature was reached the sample was introduced and maintained at this temperature for 1 hour, when a release of the supporting wire caused the test piece to fall into a bucket of mineral oil. The metal was vigorously agitated in the oil until quite cool. The temperature of soaking was recorded by means of a thermocouple resting on the head of the specimen while in the furnace, a check on the constancy of the temperature being effected with the aid of a thread recorder.

Oil was used as the quenching medium owing to the fact that previous work on these steels had shown that in certain cases quenching cracks readily form. In a paper by Edwards and Norbury is inserted a note on quenching cracks relative to these steels, which states that "water-quenching above 900 degrees Cent. gives cracks in most of them." Indeed, steels in the 1 to 6 series cracked seriously when quenched from all temperatures above 900 degrees Cent., while steels G, H, and I, those authors state, "did not crack with any of the quenching conditions applied."

No replacement of the furnace atmosphere with an inert gas was found to be necessary, as only a small amount of surface oxidation was apparent, so long as the passage of an air current up through the furnace was prevented by stopping the lower end of the tube. No appreciable temperature gradient was noted in the particular portion of the furnace, that is, the center where the samples were suspended.

On cleaning and subjecting a few of the steels to tensile tests, it was soon clear that cracks or incipient cracking had been produced by the operation of quenching. Accordingly, the remaining specimens were subjected to a 1-hour tempering in a lead bath 500 degrees Cent., and, later most of these to a further 1-hour tempering at 650 degrees Cent.

Each specimen was treated separately by immersing in molten lead, the higher temperature was the maximum which could be attained after well lagging the lead bath by packing round with asbestos sheet. After tempering, they were withdrawn from the lead and allowed to cool on an iron plate in the air. Again the test-pieces were polished up in the lathe. Table III gives the results of tests conducted on specimens thus treated.

As indicated, numbers 1 and 2 broke in the shoulder, as also did A, hence B and C were tempered for one hour at 600 degrees Cent. The latter was badly pitted, due to oxidation, and broke in the shoulder, obviously due to a crack. Later, cracks were observed in the polished heads of E and G.

Use Brinell Hardness Tests

The hardness of the several specimens, after the various heat treatments, was examined by the use of a hardness testing machine, with 10-millimeter steel ball and a constant load of 3000 kilograms.

A glance at Table III will show that in some cases a true tensile strength was not obtained, due to fracture taking place prematurely in the shoulder of the test piece; this rendered the evaluation of elongation percentage worthless. It is of interest that in the numbered series both 1 and 2 broke in the shoulder on testing after quenching, while the other four samples of this series, on tempering at 500 degrees Cent., and 650 degrees Cent., for 1-hour, broke in the usual manner with contraction and fracture.

The ready tendency of this series to incipient cracking with any quenching operation, as previously remarked upon, would lead one to expect trouble in the tensile machine, yet none such was met with in 3, 4, 5, and 6. Certainly the initial stresses set up in the alloys by quenching are largely, if not entirely, removed by the tempering, but that cracks were almost certainly present was clear from an examination of specimens 1 and 2. In both these alloys the cause of fracture was manifest, as shown by a dark annulus round the fractured parts.

It was after a test had been carried out

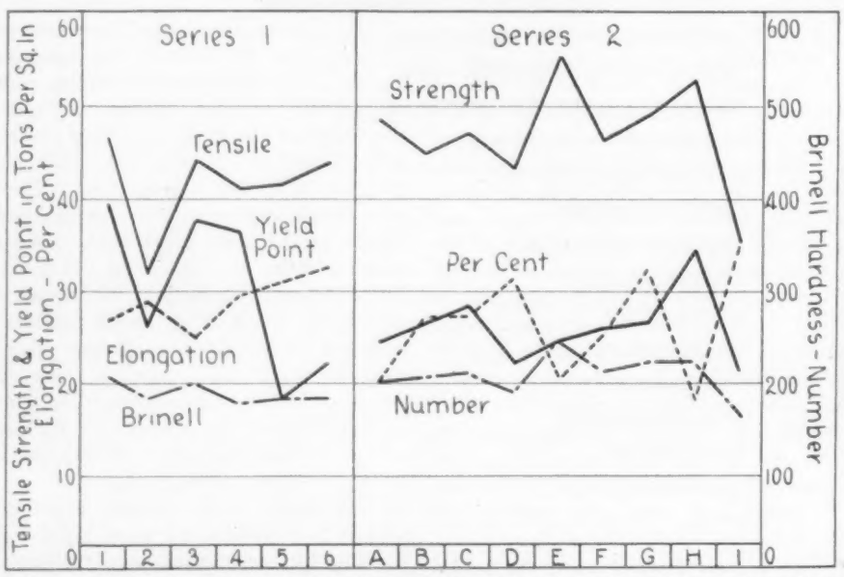


FIG. 1—CHART SHOWING CHROMIUM EFFECT ON CARBON STEELS ANNEALED AT 800 DEGREES CENT.

on A that it was decided to raise the temperature of tempering from 500 degrees to 650 degrees Cent., hence the major portion of the batch received a double tempering treatment. Even with this severe easing of quenching stresses, C and G broke in the shoulder. In an endeavor to obtain complete figures for the whole series, repetitions on quenched specimens were carried out, with the results shown in Table III. Again the efforts with regard to A and G were unsuccessful, so were abandoned.

Consider Results of Tests

The points as plotted along the abscissa of the accompanying diagrams are arranged in order of samples indicated in Table 1, which represents an increase in chromium content in the two separate series of approximately constant carbon content. From Fig. 1 it is observed that in the low carbon steels the addition of chromium from 2 up to 12 per cent has little effect on the tensile property, when such steels have been annealed at 800 degrees Cent. The marked exception is obtained with the sample containing 4 per cent chromium. A slight general increase in elongation is noticed, while the brinell hardness varies within narrow limits. In the high carbon series the high tensile strength given with sample E may be noted.

The properties obtained with samples annealed at 850 degrees Cent., show that there is a gradual increase in the tensile from specimen 2 to E across the two series; the hardness takes a similar course, and an increase in strength is accompanied by a fall in elongation percentage. A general consideration of the diagrams, illustrating the properties after annealing at 850 degrees Cent., indicates that there do not appear to be any boundaries marking ranges of composition where any abrupt change in properties is obtained, which is in agreement with the observations noted by Monypenny, who states that "No evidence has been obtained chromium steels can be divided up into a number of areas of composition the properties of which differ from each other, owing to the presence of different double carbides." Certain evidence however, is, obtained by the present author when the temperature of annealing is raised to 960 degrees Cent. A comparison of the charts affords considerable interest, and provides facts which it is believed have not hitherto been noted and which do not appear to lend themselves to a satisfactory theoretical explanation on our present knowledge of the constitution of iron-chromium-carbon alloys.

To obtain a complete annealing of these steels it should be necessary only to heat them to a temperature at about the Ac1 transformation and then cool slowly. Hence it is clear that 1, A, B, C, and E should have been annealed by the first heat treatment. The data, however, show a slight fall in the tensile strength and hardness after annealing specimen 1 at 850 degrees Cent. While a marked fall in the properties, accompanied by a decrease in the elongation, is obtained by annealing at 960 degrees Cent., the tensile is reduced from 46 to 35 tons per square inch. Specimen A shows a slight fall in tensile, B remains constant, while C has a higher tensile strength when the annealing temperature is raised from 800 to 850 degrees Cent.

Table II

Mechanical Properties of Annealed Steels

Specimen No.	Annealed at 805 degrees Cent. Yield point, tons per square inch	Tensile strength tons per square inch	Elongation per cent	Annealed at 850 degrees Cent. Yield point, tons per square inch	Tensile strength, tons per square inch	Elongation per cent	Annealed at 960 degrees Cent. Yield point, tons per square inch	Tensile strength, tons per square inch	Elongation per cent
1	...	46.8	26.6	25	45.2	26.5	18	34.8	23.4
2	26.0	32.0	28.8	15	32.1	35.1	19	38.8	25.8
3	38.0	43.9	25.0	16	36.6	34.2	21	40.2	25.0
4	36.0	40.8	29.7	21	39.4	32.0	20	43.8	23.4
5	18.0	41.2	31.2	20	42.7	27.3	24	42.6	25.8
6	22.0	44.0	32.8	21	42.4	29.7	20	43.6	23.4
A	24.0	48.6	20.3	25	44.3	30.5	40	61.0	8.6
B	26.0	44.8	26.5	29	45.3	31.2	30	60.5	9.35
C	28.0	47.6	26.5	28	50.0	23.4	30	54.5	18.7
D	22.5	43.1	31.2	24	50.0	25.8	26	53.5	17.2
E	25.0	56.4	20.3	24	52.2	19.5	42	58.9	3.1
F	26.0	47.2	25.8	24	43.5	30.5	26	52.7	18.7
G	27.0	49.6	32.6	24	47.1	26.5	24	44.4	26.5
H	34.0	53.2	18.0	24	47.1	23.4	24	43.4	25.0
I	21.0	34.8	34.4	16	33.3	32.0	18	32.3	28.9

Change in Physical Properties

The most striking feature of the series of tests is obtained when the annealing temperature is raised to above 900 degrees Cent. In the low carbon series there is not any marked change in the tensile strength and hardness, except in the steels with 2 per cent chromium and with 4 per cent chromium, the latter showing an increase in both properties. On passing to the second series a profound influence on the physicial properties is manifest the tensile of the first two with 2 per cent chromium, rising above 60 tons per square inch, with the brinell hardness rising correspondingly and the elongation being reduced from above 30 to below 10 per cent. Steel E, little different in composition from D, is most remarkable in the manner in which its elongation approximates zero, an increase of 7 tons in the tensile being accompanied by a fall from 20 per cent to 3 per cent elongation; the hardness changed from 235 to 330. Steels G, H, and I, become softer at the highest annealing temperature.

With reference to the quenched specimens, the chief feature worthy of note is the persistence of the properties usually associated with quenched steels even after tempering for one hour at 500 degrees Cent., followed by a further tempering at 650 degrees Cent. Resistivity determinations on these steels which have been tempered subsequent to quenching show that in the low carbon series a minimum resistivity value was in most cases obtained at 700 degrees Cent., or below. In the high-carbon series a minimum, represent-

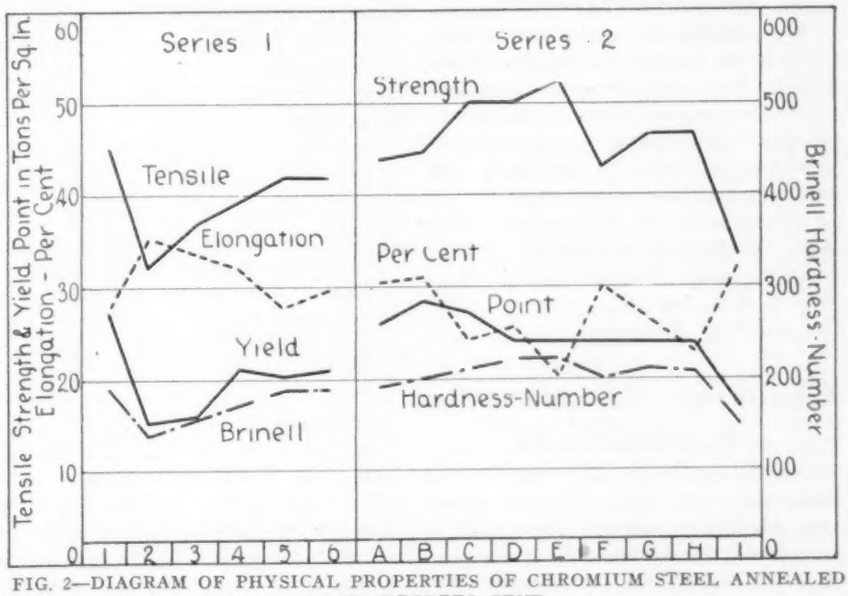


FIG. 2—DIAGRAM OF PHYSICAL PROPERTIES OF CHROMIUM STEEL ANNEALED AT 850 DEGREES CENT.

ing a considerable fall in resistivity, was always obtained on tempering at 650 degrees Cent. This fact appeared to be independent of the quenching temperature, except in so far that the lowet the quenching temperature the more readily was this minimum value obtained on tempering at temperatures below 650 degrees Cent.

In the first series, apart from No. 1, there is little difference in the tensile strength and elongation caused by varying the amount of chromium, but the magnitude of these quantities differs considerably from those resulting from annealings at temperatures of 800 degrees Cent., and upwards, and hence they do not fall into line with the electrical resistivity experiments. The divergence from the resistivity work is still further emphasized in the second series. Tempering at 650 degrees Cent., after quenching, leaves the tensile strength in the vicinity of 80 tons per square inch, with a percentage elongation between 0 and 10. The brinell hardness numbers are similarly high.

As previously indicated, it is not easy to find a satisfactory theoretical explanation of the marked alteration in the mechanical properties of these steels when annealed at 950 degrees Cent., and allowed to cool slowly, and the author refrains from theorizing until more data are available on their constitution. This difference, however, in the influence of increasing the annealing temperature is in all probability associated with the fact that the nature of the carbides which are formed in the annealed steels changes with the initial temperature to which they are heated.

Further, a considerable amount of evidence which seems to indicate that this is the case has been put forward by Murakami. According to Murakami's magnetic observations, the character of the carbides more readily changes when the specimens are being heated to temperatures not far below those at which the carbides go into solution. It may be that the extent to which such changes occur on heating have a marked influence on the rate at which equilibrium is re-established after complete solution of the carbides.

Finally, it is of interest to refer to the age hardening of quenched austenitic steel. A sample of I, which on quenching at above 1200 degrees Cent., had given a brinell hardness of 250, on leaving at atmospheric temperature for 18 months increased in hardness to 420. In this connection reference may be made to the work of Brush, who has made extensive observations on the heat evolution at ordinary temperatures on steels that had recently been hardened.

He noted a heat evolution, greatest immediately after hardening, diminishing in ratio with time and becoming imperceptible after several weeks. The physical changes accompanying this spontaneous evolution were small in comparison with those accompanying even slight tempering.

Table III

Mechanical Properties of Quenched Steels

Specimen No.	Heat treatment after quenching	Tensile strength, tons per square inch	Elongation, per cent
1	Not tempered	44.0	Broke in shoulder
1	Tempered 1 hour at 610 degrees Cent.	74.4	11.0
2	Not tempered	78.0	Broke in shoulder
2	Tempered 1 hour at 610 degrees Cent.	56.3	18.7
3	Tempered at 500 and at 650 degrees Cent.	60.4	17.2
4	Tempered at 500 and at 650 degrees Cent.	59.2	18.0
5	Tempered at 500 and at 650 degrees Cent.	56.4	17.2
6	Tempered at 500 and at 650 degrees Cent.	60.1	18.7
A	Tempered at 500 degrees Cent.	64.0	Broke in shoulder
A	Tempered 1 hour at 650 degrees Cent.	56.0	Broke in shoulder
B	Tempered at 500 and at 650 degrees Cent.	85.7	6.25
C	Tempered at 500 and at 650 degrees Cent.	31.0	Broke in shoulder
C	Tempered 1 hour at 650 degrees Cent.	75.3	11.0
D	Tempered 1 hour at 500 and at 650 degrees Cent	73.5	7.0
E	Tempered 1 hour at 500 degrees Cent.	81.0	11.0
F	Tempered 1 hour at 500 degrees Cent:	75.8	12.5
G	Tempered 1 hour at 500 degrees Cent.	49.0	Broke in shoulder
G	Tempered 1 hour at 650 degrees Cent.	59.0	Broke in shoulder

To Study Heat Treatment on Magnet Steel

The metallurgical and electrical divisions of the bureau of standards, Washington, in co-operation, are beginning an investigation to determine the effects of various heat treatments upon the characteristic properties of the steels now used commercially or suggested for use in the manufacture of permanent magnets. During the past month about 10 samples were hardened, and it is hoped that they will soon be ready for the first magnetic tests.

Choosing Reagents for Etching Steels

An investigation concerning etching reagents to be used with alloy steels has been under way at the bureau of standards, Washington, for some time and has resulted in a number of interesting conclusions. The metallographic etching of alloy steels with the usual acid etching reagents fails to identify the different constituents that may be present in the alloy steel, such as the carbide of iron, chromium, tungsten or vanadium, tungstide of iron, and possibly double carbides.

This point is of particular importance where two or more of the constituents are present simultaneously in the microstructure as has been found to be the case with high speed steels and iron-tungsten-carbon alloys.

It was seen early in the investigation that, on the one hand, the use of the usual inorganic acids offered little hope of success because of the general resistance of the above mentioned constituents to the corrosive action of the acids, while, on the other hand, alkaline solutions of an oxidizing nature offered considerable promise in producing distinctions by means of etching characteristics.

A little more experimental work was next carried out on various alkaline solutions with and without the use of oxygen gas or oxidizing agents, the results of this work being the development of a new etching reagent, namely, a potassium permanganate and sodium hydroxide mixture.

With the object of establishing the identity of the metallographic constituent known or believed to be present in the microstructure by noting its behavior toward the various etching reagents, etching tests were made on various amounts of the alloying element and of carbon. For this experiment a number of etching reagents of an alkaline nature, among which were several well known reagents, such as sodium picrate, Yatsevitch's reagent, etc., were used. Heat tinting also was tried. The method of sequence etching or etching with two or more reagents in succession without any repolishing of the specimen between the etchings was used with success in cases where more than one constituent is present in the microstructure, as in high speed steels.

The results obtained so far show that it is possible, by proper selection of the etching reagent, to determine in a satifactory manner the presence or absence of the different constituents in the microsection and also to distinguish between several of the constitutents when two or more are present in the same microsection, as, for example, cementite and chromium carbide, or cementite and iron tungstide. No method has as yet been found for distinguishing between chromium carbide and tungsten carbide other than from a consideration of the shape of the particles which these constituents have been found to assume should both occur in the same microsection.

Melts with Oil in Air Furnace

Coal-Burning Furnaces Used To Melt Malleable with Slight Changes in Combustion Chamber—Figures Given Showing Relative Cost of Coal Firing and Oil Firing—Oil Consumption Recorded

BY D. I. DOBSON

THE increasing cost of good melting coal, high freight rates, diminishing supply, etc., is causing malleable foundries to consider other fuels than West Virginia coal as a melting medium. The extreme simplicity of converting a coal-fired furnace for the use of fuel oil, ease of handling, and lowered melting costs, have caused malleable foundrymen to consider the use of oil. Unfortunately some pioneers in this field have been unsuccessful in obtaining uniformly good heats. Oil fuel has thus received at the outset a reputation of being tricky, excessively oxidizing, and uncertain.

As early as April, 1921, the Sampson Tractor Co. division of the General Motors Corp. experimented with fuel oil for melting purposes at the plant of the Waukeshaw Malleable Iron Co., Waukeshaw, Wis. For more than 6 months four furnaces have been operated successfully with oil. One furnace has been in constant operation since June, 1921.

The only change necessary upon the furnace is the conversion of the combustion chamber as illustrated in the accompanying illustration. The firebox must be filled in on top of the grates with ashes, cinders, broken firebrick, or any available refractory material. Two inner walls should then be constructed on top of this filler to form a V-shaped combustion chamber, 10 to 12 inches apart at the burner end, and spreading to the full width of the furnace at a point slightly in advance of the front bridge. The burner may be introduced inclined toward the iron horizontally, or up away from the iron. This company has experimented with the burner inclined rather sharply toward the iron, but has obtained the best results with but a slight inclination toward the bath with the burner about 2½ feet above the level of the bath. The floor of the combustion chamber is filled with firesand, and conforms in slope with the pitch of the burner.

To lengthen the combustion chamber somewhat a small box-shaped addition has been made. It is supported by 3-inch channels with 1-inch steel stringers bolted to the furnace plates at one end, and uprights, formed of 1½-inch pipe at the other end. With this addition the combustion chambers measure a trifle over 8 feet from burner to front bridge.

A good burner is one which atomizes the oil thoroughly. Either steam or compressed air may be used to effect atomization. In this installation air at about 70 pounds pressure has given the most satisfactory results. Many types of burners are on the market, some designed especially for air furnaces. We are using home-made burners, and find them satisfactory. The burners are introduced through a cast-iron T. The front blast is brought in through the bottom of this T. Some plants have placed the front blast above the burner and some below. We have experimented with the burner above the blast, but found the effect highly oxidizing.

Flame Requires Adjusting

The oil flame is different from the coal flame in several respects, namely, the manner in which combustion occurs, and the shape of the flame produced. The flame may be compared favorably with a gas flame. There is first of all a zone of combinations, and then a zone of completed oxidation. These zones, of course, grade into each other, but may be shortened or lengthened at will by supplying more or less air through the front blast.

Our practice is to start with the front blast set at its maximum. This causes combustion to take place early and gives a hot fire at the front of the furnace, though the flame is quite short. The iron starts to drip in front within 35 to 45 minutes on a cold furnace, and in 20 to 30 minutes after recharging.

The oil is fed so that at no time is there a great amount of smoke coming from the top of the stack. After the iron starts to drip, the blast is cut to lengthen the flame. The hottest zone of the fire is thus worked gradually through the furnace. However, care must be taken not to move the blast too quickly, or the melting will be hung up in the part skipped over.

Dampers have been installed on the top of each stack to aid in maintaining a uniform pressure in the furnace when reducing the amount of air of the front blast. The top blast is led in through five 2-inch pipes at a point slightly beyond the old front bridge. It is kept wide open all through the heat.

Some poking and skimming is necessary on the part of the operator, though his work is light when compared with that of the coal fireman. A good illustration of the comparative work is that during the hottest weather of last August one man operated a furnace, while on similar occasions heretofore three firemen have been used.

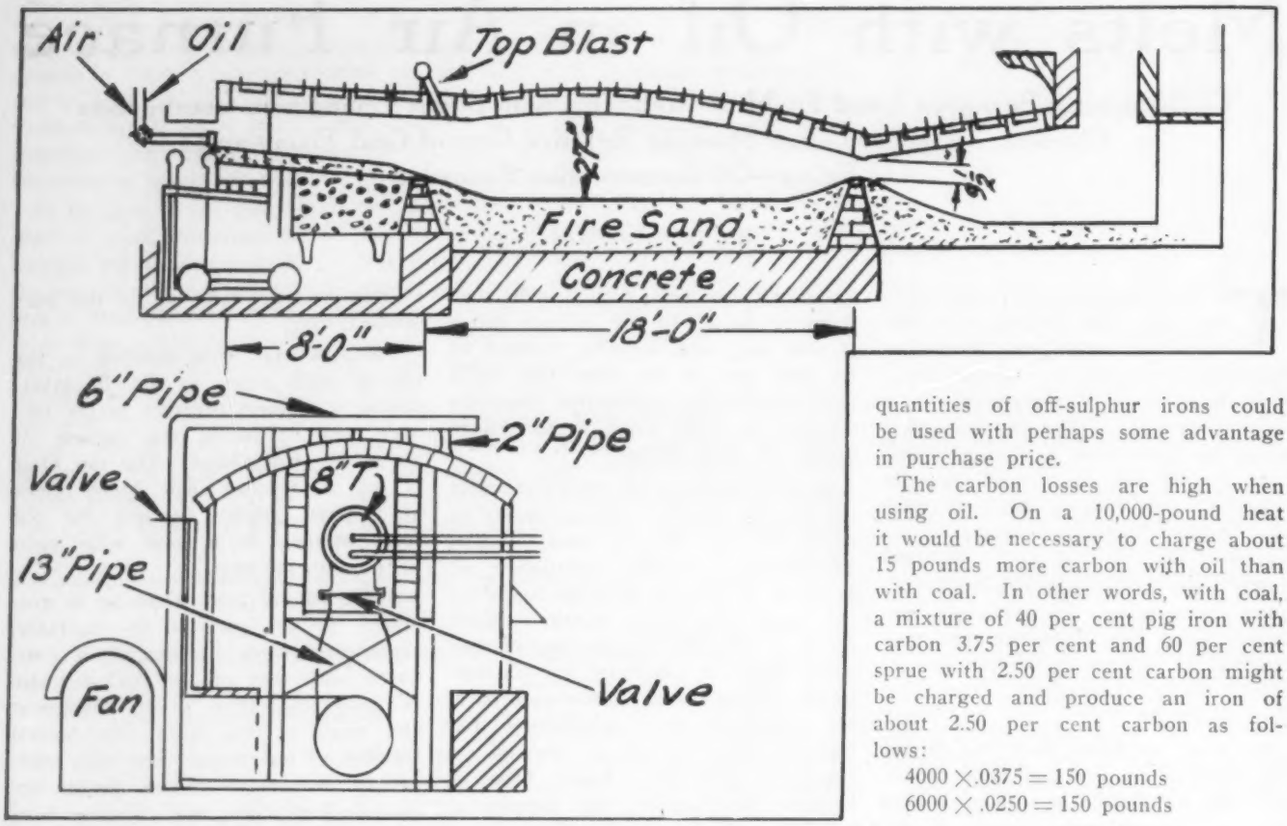
Oil pressure is maintained at the pumps at about 90 pounds. Each pump feeds two furnaces, and since a line drop occurs, the first furnace receives oil at 80 pounds pressure, while the second receives oil at 60 pounds pressure. The pressure is not of real importance except that it insures a proper volume of oil flowing through the burner orifice. The oil line valves are never opened more than a turn and a half and at times heats have been melted with oil pressure at 20 to 30 pounds.

Air pressure at the burner, which is used to atomize the oil, is more important. We have found that better atomization is effected with air pressures over 50 pounds. The air pressure varies at times from 50 to 85 pounds.

Air for combustion is delivered by a fan, the tip diameter of which is 42 inches and width of blades 12 inches. It makes 1050 revolutions per minute. Air is discharged through an opening 13 inches in diameter. The top blast is taken off this 13-inch pipe by a 6-inch pipe and is delivered through five 2-inch pipes from a 6-inch header. It is estimated that neither front or top blast is under more than 10 to 12 ounces pressure, although this has not been verified.

The equipment necessary for the use of fuel oil consists of tanks for stor-

Paper read at a recent meeting of the Milwaukee Malleable club, Milwaukee.



FRONT VIEW AND CROSS SECTION OF AN AIR FURNACE CONVERTED FROM COAL FIRING TO BURNING OIL

age, pumps and feed pipes. It is also desirable to have a return line.

Provision must be made for heating the oil in cold weather. Steam coils may be inserted in the tanks for heating purposes, though care must be used to prevent leaks in the coil, for water in the oil line is disastrous to the heat. Each storage tank should have a drain valve on one end, and should be given a slight pitch toward the drain. Water accumulates from fuel oil as it stands.

Pressure Gages Are Used

A return line is also of service during cold weather, for by keeping the oil circulating slowly at night it is possible to prevent the oil in the feed pipes from becoming gummy. This company is using fuel oil from 19 to 25 degrees Be. Such an oil flows freely at 70 degrees Fahr., though better satisfaction is obtained when it is heated to 80 degrees or higher. Difficulty will be experienced in maintaining suction at the pump if the oil be heated above 110 degrees Fahr.

We have found an oil-pressure gage and an air-pressure gage to be useful to the operator at the furnace. Indication is thus readily given in case of trouble either at the pump or compressor. Other miscellaneous equipment at each furnace includes an oil meter, strainer, pressure regulator, and a drain valve for letting out water should it by any chance get into the line.

We have worked with the conviction that a furnace has a rated capacity of oil per hour. Such capacity is that which will give at least 15 per cent carbon dioxide over the rear bridge. Carbon dioxide may be determined readily by any of the apparatus on the market for that purpose. The amount of flame over the rear bridge is a good indication of correct operation.

Morning heats require 5¼ hours from start to tapping, and second heats are taken out in 4¼ hours. Loss in silicon varies from 0.30 to 0.35 per cent on the morning heat, and from 0.20 to 0.25 per cent on an afternoon heat.

Loss of manganese averages 0.158 per cent. Some difficulty is experienced in keeping manganese low enough, though by mixing a 0.60-per cent manganese coke iron with a 0.35-per cent manganese charcoal iron, and sprue of about 0.28 per cent manganese, this element may be maintained below 0.30 per cent.

Fuel oil adds little if any sulphur to the iron which, in our case, contains an average of between 0.035 and 0.040 per cent sulphur. The low sulphur may explain the small losses of manganese. At any rate large quantities of off-sulphur irons could be used with perhaps some advantage in purchase price.

The carbon losses are high when using oil. On a 10,000-pound heat it would be necessary to charge about 15 pounds more carbon with oil than with coal. In other words, with coal, a mixture of 40 per cent pig iron with carbon 3.75 per cent and 60 per cent sprue with 2.50 per cent carbon might be charged and produce an iron of about 2.50 per cent carbon as follows:

$4000 \times .0375 = 150$ pounds
$6000 \times .0250 = 150$ pounds

300 pounds
$10{,}000 \times .0250 = 250$ pounds

50 pounds loss:

Equals 16.65 per cent of the carbon charged.

Whereas, with oil, it is necessary to charge 5000 pounds of 3.75 per cent carbon pig iron and 5000 pounds of 2.50 per cent carbon sprue to obtain carbon in the hard iron at 2.50 per cent.

$5000 \times .0375 = 187.5$ pounds
$5000 \times .0250 = 125.0$ pounds

312.5 pounds
$10{,}000 \times .025 = 250.0$ pounds

62.5 pounds loss:

Equals 20 per cent of carbon charged.

The effect is to lower the amount of sprue which may be charged. However, we have maintained carbons constantly from 2.30 to 2.50 per cent while charging an average of 48 per cent hard iron. This figure might be increased to 55 per cent if necessary by charging about 1 per cent petroleum coke on the bottom of the furnace with each charge.

Phosphorus is neither lost nor gained but comes in the iron in about the same proportions in which it was charged.

From 5500 to 6500 gallons of oil are consumed on each of the furnaces per week of 11 heats. The capacities of

(*Concluded on page* 41)

Preventing Manufacturing Waste

Production Should Be Scheduled According to Forecasts of Demand Made by District Sales Managers—Standardization Is of Vital Importance—Purchasing Agent Is Made Responsible for Quality and Quantity of Supplies

BY R. W. GARDNER

IN THE consideration of waste prevention, we are apt to use the term, "waste," without a definite idea of what waste really is, so that without a careful analysis, we are unable to concentrate upon the factors which aid in its elimination. Efficiency is not an abstract quantity, but is a ratio of the useful result obtained to the effort expended in an operation of any kind. Effort and result can always be translated into dollars and cents, and it is for this reason that the business man is interested in efficiency. It is the law of nature that everything must be paid for in some manner. Therefore, the difference between the effort and the result, expressed in dollars, or watts, or what not, represents the payment which we must make for the accomplishment of the result. As we never reach 100-per cent efficiency, it is fundamental that there is this difference in value, which is legitimate and irreducible, between the effort and the result. We would define waste, therefore, as the excess effort over that which we acknowledge as necessary, legitimate and practical. In speaking of what is necessary and irreducible, it must be taken in a relative sense, as obviously what would be considered irreducible today will not be considered irreducible tomorrow.

Eliminate Unessentials

The subject of waste really is a depressing one because it is a negation. It would seem that more enthusiasm would be taken in its elimination if our attention were concentrated upon the positive action of determining exactly what is absolutely necessary. If unnecessary effort, if misdirected energy, could be eliminated, waste in great measure would disappear with it. Psychologically, there are perhaps a majority of us who are more interested in accomplishment than in saving. Consequently, let us direct our attention toward a study of the ideas and methods which make it possible, under certain conditions, to utilize the minimum of effort for the accomplishment of a given result, thereby eliminating this excess effort as unnecessary and, therefore, wasteful. It must be appreciated that many of the factors are beyond our direct control and, therefore, our influence upon others is as necessary to the accomplishment of our purpose as our direct action. Good influence will have its reaction and will redound eventually to the benefit of ourselves, as well as the world.

From an address presented at the Hot Springs, Va., meeting of the Electric Power club, June 14. The author is vice president, Otis Elevator Co., New York.

Synchronize Output and Demand

One of the largest factors which often is beyond the direct control of the manufacturer is the lack of co-ordination between sales policies and production schedules. Sales policies often are not founded upon fundamental economic conditions and often react to the disadvantage of the manufacturer in maintaining a production that is not justified. A forecast of the future is of the greatest value.

The manufacturing company with which the author is connected has endeavored, for some years to maintain a forecast system of sales, in which the responsibility is put upon the sales managers of the various districts throughout this and other countries to ascertain what the demand is for our product. Our principal fear is not overproduction, but lack of demand. Therefore, by keeping production properly synchronized with demand our business can be conducted on the most efficient basis. Of course, the correctness of this forecast is not absolute, but our experience has been that it can be made correct to the extent of 85-per cent of the total sales.

The further one looks into the future and attempts to make deliveries at the right time and in the right quntity, the more apparent it is that there is a great necessity for simplification and standardization of the product. If unlimited license is given to the sales department to sell anything that the whim of a customer may desire, a forecast becomes impossible. This matter is mentioned in particular because we regard it as the starting point in approaching the real subject of this discussion.

With this preamble, let us now examine the factors which are under the direct control of the manufacturer. We cannot escape the charge that unnecessary effort in the accomplishment of the result desired must be laid at the door of faulty management. Faulty management may consist of faulty plants, faulty equipment, faulty control of materials and inefficient men.

Simplification is taken as a fundamental principle of up-to-date manufacturing. This includes standardization, which would be a farce if it did not simplify. Investigation and research must be carried into new fields to seek out every new development and method which would affect economy in every manufacturing process. This must be conducted in the shop as well as in the engineering offices and laboratories. Having developed a product, it is next necessary to see that the details of its design shall permit the utmost economy in the use of materials, and that it is suitable for the use of the best manufacturing processes. Much loss of time and material is saved if drawings and material lists are accurate and complete in detail so that the office clerk or shop workman may know exactly what is to be done.

This is no easy matter to obtain and it is only through a co-ordination of effort and co-operation between the technical staff and the manufacturing departments that such a result can be approached. Each is necessary to the other because no one group can encompass all the theoretical and practical details which are involved. To this end we submit new designs to the manufacturing department for its suggestion and criticism before placing in production. This, in every case, results in valuable suggestions that lead to improvement.

Standards Described

We issue to our designers and to the production department a loose leaf volume in which are listed standard definitions and parts consisting of commercial commodities which we deem standard as well as our own standard parts. The use of this book tends toward simplification, because it discourages the multiplication of parts, which often need not be different merely because they have a new application. We keep in mind that the manufacturing department should demand as its right data properly associated and so complete in detail that its entire time may be devoted to the most efficient methods of production. We keep as a slogan before the minds of our men the three important factors—quality, cost and appearance. Let us

now turn to the four factors of faulty management.

With the modern heavy duty, high speed freight elevators, our studies have shown that vertical transportation often is more economical than horizontal transportation. Long, 1-story buildings, except for the handling of unusually heavy machinery, no longer are best adapted for general manufacturing and internal transportation.

A cause which contributes greatly to waste in manufacturing is improper or poor planning of new buildings. A new building should be designed by manufacturing experts rather than by an architect. Doors, floor areas, elevators, aisles, etc., should be planned from basic data and a study of the equipment and tool hours which will be required for the production assigned to the building. To this a certain reserve should be added and then passed to the architect's office. Serious errors have occurred in having buildings designed by an architect unfamiliar with manufacturing and production problems; one who attempts to fit the business to the building instead of constructing the building around the business.

Selection of Equipment and Tools

On the general subject of machine tools, we believe in the use of standard machine tools except in cases where the part to be produced is of a shape and size that is peculiar to our particular industry and where the quantity is such that a machine tool can be kept continuously busy. In these cases we favor the use of special purpose tools, generally designed and built by ourselves, with the sole purpose of performing the operation with the greatest economy.

Of equal importance are the small tools, without which the machine tools would fall far short of reaching maximum results. For instance, we might mention the finishing of a gear case, which being machined on a special machine tool took two and a half hours to complete. But by the design of a proper fixture with boring, facing, and milling attachments these three operations can be done at one setting and at the same time, and the time is reduced to one-half hour instead of 2½ hours. This illustrates that good machine tools need to be supplemented by good small tools to obtain maximum output.

Other economies might be mentioned, such as the use of various materials for cutting tools. It has been possible by the use of stellite tools instead of high speed steel tools, to increase speeds and feeds, in some instances as much as 70 per cent. In addition to increased speeds and feeds, the amount of work turned out between grindings is much greater. For example, in grooving driving sheaves, it was considered that when a tool grooved six grooves it was a good performance. With the use of stellite it is possible to make several hundred grooves without grinding the tools.

Another source of unnecessary expense which may be hidden except from the expert, is the excessive cost of power, either when generated by the industry itself or when purchased from a public service corporation. A careful study of the power problem invariably results in a saving. A department arranged with line shafting driven by motors may develop on test to have an excessive power cost because of the unscientific selection of motors, either of wrong size or too many or too few. Usually when a test is made in any given department with the proper recording instruments it is evident that by rearrangement or change in the horsepower of the motors, a considerable saving can be made.

The purchasing department has an important function to perform in the placing of orders and obtaining material to meet current needs, at the same time avoiding either short or excess stocks. Here again is the advantage shown of forecasting requirements well in advance and keeping the purchasing department well informed as to the requirements of production. To maintain quality, the materials are purchased upon standard material specifications. We look upon the purchasing agent as being responsible for obtaining material of the quality desired. Such material, when received, does not pass into our stores department until the purchasing agent can show that it is the right quality.

To obtain the data necessary as to quality, which may involve chemical analysis, physical or electrical tests, the facilities of our laboratories are placed at the disposal of the purchasing agent; the results of analysis or test being reported directly to him. He accepts the material and forwards it to the stores department or rejects it and returns it to the manufacturer. It is unnecessary to dwell upon the loss which may thus be saved in knowing that the materials are of suitable quality. Great loss might be entailed if parts were rejected later in the process of manufacturing, or still worse, if they reached the field and there failed to give satisfactory results. A vendor will replace defective material but will not reimburse the purchaser for any labor that he may have expended upon the material. Therefore, if material is to be rejected, it is essential to reject it at the time of receipt.

Too much stress cannot be laid upon the advantage of having the proper quantity of materials on hand at the right time. The development of shortages, resulting in the breaking up of an operation, results in a loss that runs through the entire organization. This, in turn, is governed largely by the forecast. Suppliers must be given ample time for the delivery of their materials. The manufacturer who is not protected by a forecast is liable to neglect placing orders for material until its use is needed and the supplier is then urged to make impossible deliveries. The accumulation of such urgent demand creates a peak load on the supplier which he cannot meet. When the delivery of an entire order is not required at one time, we furnish the supplier with a definite delivery schedule and give the quantity per month which should be delivered. We also take into account orders for other parts from the same supplier and the capacity of dies, molds or other tools which may be necessary for the production of the material.

Material Handling Important

There is much room for the elimination of waste, time and material, in handling materials from the time they are received in the plant, transported through the various manufacturing sections, and finally shipped. One of our greatest savings has been in the elimination of labor in our internal transportation system at the Yonkers works.

The use of storage battery elevating platform trucks for interdepartment delivery, and the use of cam-operated elevating platform trucks for departmental movement of material, have reduced handling charges to a minimum. Our system of transportation is coordinated under one head who supervises the movement of motor trucks on the outside of our plant, and the movement of all power and hand trucks used for internal transportation. In the central office is a dispatcher who dispatches trucks on a predetermined route, and schedules their movements much the same as a train dispatcher regulates the operation of trains on a great railroad system. The parts handled by these trucks are carried on specially designed platforms or skids and remain on the platforms continuously in their travel to the final assembly department. In other words, when a piece is taken off the bench or machine tool, it is placed on one of these special platforms and moved to the next operation by the transportation men without the use of crane or helper. Overhead cranes, except for parts too heavy to be handled by elevating platform trucks, have been abandoned as a means of transportation.

It is no longer considered a fad to lay great stress upon the orderly appearance of departments by using metal strips or white painted lines for aisles, and having the material stored symetri-

cally and in alignment. An orderly department indicates a foreman with an orderly mind, and more orderly and accurate work is produced by the operatives of such a department. Good housekeeping in industry is good business. Constant attention to the small details of material arrangement, the idea of order and precision gradually is inculcated into the minds of the employes, and before they appreciate the fact, they are doing better and more orderly work on account of their environment.

Handling Men to Advantage

In all modern industries the recruiting of man power is under the scientific control of an employment or personnel manager. His duties do not end when the "hiring slip" is signed. He sees that the men hired are properly placed where their ability will function to the best advantage of the company. There are many examples of waste energy and waste labor caused by improper assignment of men to tasks. A live wire personnel or employment manager will recommend such transfers to the general foreman or shop superintendent as his observations indicate are wise.

With the increasing difficulty of obtaining skilled mechanics, it has become necessary for most industries to conduct a school of instruction and to make their own mechanics. Where the manufacturing is specialized, and where the quantities are large, the machine operators can be schooled and instructed in a short time to operate drill presses, milling machines and various specialty tools. They give a production about equal to a skilled mechanic at a much less cost.

Lack of adequate supervision of labor is uneconomic and often results in excessive costs, waste, rejected and defective material. The supervision required over a given department is that found necessary to give the greatest production at the lowest cost. The amount of supervision in most cases is susceptible to calculations, but rarely is figured carefully. When studied, its cost is low compared with the cost of defective and spoiled material, and the loss due to machines not operating at their proper feeds and speeds, together with the actual lost time of the operator being away from his task during the day, or not reporting promptly to the task at the starting time.

The problem of inspection is a growing one at the present time due to the lack of the old time machinists, and it is usually the case that practically all parts must be passed by an inspector especially if they are parts of an assembled unit. Both time and money can be saved by discovering errors of machining before the piece becomes part of an assembly.

While considering the subject of workers, it must be remembered that today women have a definite place in industry, and their earnings should be proportioned to their production. On certain classes of work, the small hands and the more delicate touch of a woman is more efficient than the clumsy hands of the average workman.

The conservation of health and productive ability of employes warrants considerable study. Welfare, like so-called efficiency, has been carried to the extreme in many industries. It would seem that the underlying principles are to keep the employe well, happy, and constantly at his task. Analyzing this thought, the first requisite is a sanitary place to work; the second is enough social life to keep him happy but not on too elaborate a scale; and the third, a well organized accident prevention and safety committee, a hospital, dispensary or first aid presided over by a registered trained nurse who can take care of all minor injuries and keep the man at the task and a visiting doctor who calls once a day and does the required dressing, etc. While this may be called welfare, it is in reality good business, as it prevents the men losing a great deal of time going home or to the hospital on account of minor injuries.

The following quotation from the proceedings of the sixth annual industrial conference of New York state held at Buffalo last November will help to illustrate this point:

"The 42,000,000 men and women gainfully employed in the United States probably lose on an average of more than six days annually, from illness, disability, including nonindustrial accidents—a total of more than 252,000,000 days. To reduce by one day the illness per person would be equivalent to adding 140,000,000 workers to our labor supply.

"Of the 500,000 workers who die each year, it is probable that at least one-half is postponable, by proper medical supervision, periodic medical examinations, health education, and community hygiene. There are more than 8,000,000 workers with diseases resulting mostly from infection. Infection is easily prevented. Therefore, it is an inexcusable wasteful habit to permit it to continue.

"It is estimated that 25,000,000 workers have defective vision requiring correction. The Hood Rubber Co. and the Underwood Typewriter Co. found that 20 per cent of their inspectors were unable to see sufficiently well to locate defects. It has been the experience of many that there has been a serious time-labor loss from reduction of quantity and quality of production due to defective vision and the fatigue produced thereby.

"The foregoing statements of fact are appalling. They clearly disclose wasteful industrial habits. It is known that a large per cent of such waste may be eliminated by physical examinations, attention to simple measures of hygiene and by the dissemination of information appertaining to health among the working classes. No industrial, professional or commercial employer can afford to neglect the health of his employes. It is good business to safeguard the health and the physical vigor of the employe."

Wood Screw Standards Are Published

Circular No. 140 of the bureau of standards, Washington, which has just been issued deals with the work which has been carried out by the federal specifications board on the standardization of wood screws. The standards set forth in this circular will be used in all future government purchases.

At least two systems of numbering wood screws to designate the diameter have been used in the past; methods of measuring lengths have been hopelessly at variance; and the number of threads per inch for a given size has not been the same for different makes. All this confusion has been eliminated and the dimensions of wood screws made uniform throughout the United States as the result of a co-operative agreement among the manufacturers, the bureau of standards, and the technical section on builders hardware of the federal specifications board.

The system of numbering to be used henceforth is the same as that now employed in designating machine screw sizes, except that diameters above No. 12 are also designated by numbers. This means, for example, that a No. 10 wood screw will have the same diameter as a No. 10 machine screw. Uniform methods of measuring diameter and length and uniform tolerances in these dimensions were adopted together with a standard angle for the under side of the heads of flat and oval head screws. The number of sizes of brass and steel screws manufacturd as standard was reduced from 555 to 291, a reduction of 47 per cent, while at the same time retaining a sufficient variety for every need. This reduction should benefit the manufacturer, the dealer, and the user.

Spheres Measure Light

The use of spheres for measuring light given off by a lamp has increased recently because the new gas filled lamps have an irregular shaped coil filament and cannot be measured accurately with other apparatus. The United States bureau of standards has issued a paper recently giving a complete explanation of the theory of spheres as light measurers and of the precautions that must be taken in order to eliminate errors. The sphere described, which was made by the department, is 88 inches in diameter and weighs about a ton. However for different purposes spheres from 3 inches to 10 feet in diameter have been used.

Keeping Time and Pay Records

Forms for Compiling Reports in Iron and Steel Plants Illustrated, and System That Has Proved Efficient Described—Accurate Data Essential for Labor Cost Accounting

BY CARBIS A. WALKER

AMONG the many problems involved in cost accounting in the iron, steel and metal working industries, that relating to the labor factor is one of the most important. The first step in this department is the compilation of accurate payroll data; and a thorough and efficient system, requiring the use of simple but comprehensive forms for the keeping of records, is essential. This article presents the forms used by a steel manufacturing concern employing approximately 8000 men, and describes a system that has proved satisfactory for a strict accounting of labor costs. The system may be adopted for smaller or larger enterprises, and the forms would be substantially the same.

The percentage of companies, particularly among the smaller classes, that have inadequate or cumbersome time-checking and payroll systems is high, while the labor cost probably is the most important item of their business. Costs of materials, rents, depreciations, freight rates and other factors have been analyzed carefully by some of them, while they have overlooked loopholes and inaccuracies in their hours of work and payroll records.

There are two well-known time systems, the time clock system and the check system. No one has been able to produce a standard time system for all classes of manufacturing, because the nature of the product, conditions surrounding the operation of the plant and the location of the raw material have considerable to do with the time system. Take for example the lumber manufacturing industry, where a mill is located 25 or 30 miles away from the farthest timber holdings. The log cutting force is scattered over a large territory and it would be almost impossible to have all the men punch a time clock twice a day. But under the check system, a good timetaker could reach all the men twice a day. On the other hand, in a cotton mill where all the employes are under one roof, the time clock system would be the most efficient.

In this article the writer wishes to illustrate the check method as applied to the steel industry. Let us consider for example a company employing 8000 men, which for convenience may be called the Steel Manufacturing Co. We have the following departments: Blast furnace, open-hearth, finishing mill, mechanical, boiler shop, blacksmith shop, yard labor, switching, track repair and gang labor. Every workman employed by this company has what is known as a "Notice of Employment or Change of Rate" card as shown in Fig. 1.

The cards are filed in numerical order, and according to departments. Each employe is given a brass check with a number upon it which is one of a series. All references are made by check number and name.

It is customary for large manufacturing concerns to have gatemen whose buildings and property are surrounded by a fence or wall. If an employe leaves his work during the closed-gate period he must obtain from his foreman or gang boss a pass to be shown to the gateman and the hour of departure and return will be entered upon the gateman's report. If an employe leaves without a pass or without authority from his foreman or department superintendent, he will be "docked" for the absent time. If he has any reasonable excuse for obtaining a pass, he will experience little trouble.

Timekeepers co-operate with the payroll department by obtaining information to verify reports of the time worked by the employes. Their duties must be carried out faithfully to insure accuracy and economic operation of the system.

Each timetaker has a book called the timebook. This book contains the names and check numbers of all men employed in the department or section of the payroll pertaining thereto. Fig. 2 shows the form of sheet used in the book.

The total time for the first two weeks of a month is put in the first total column as shown in the form, and the second two weeks is placed in the second total column. Each timetaker must visit each man in his department not less than twice a day, at 9 o'clock in the morning and 4 o'clock in the afternoon. Each class of work calls for a standard or "shift" time and in each department the record calls for a certain

STEEL MANUFACTURING CO.....WORKS

NOTICE OF EMPLOYMENT OR CHANGE OF RATE

GENERAL SUPERINTENDENT:

You are hereby notified of the (employment / change of rate) of

Name.....Address.....Check No.....
Position.....Department.....Age.....Rate.....
per.....Commencing.....192.. Rate, if made for individual, also to be written alphabetically.....Where previously employed.....
Position.....Department.....Rate.....per.....
Why employed or changed.....

Employment Agent — Foreman

O.K. — Approved — Entered

Dept. Supt. — Gen. Supt. — Payroll Clerk

FIG. 1—NOTICE OF EMPLOYMENT, OR CHANGE OF RATE

STEEL MANUFACTURING CO.

TIME BOOK

For the month of.....192...

SHEET..... .....DEPARTMENT

SECTION..... .....WORKS

	Force and Check No.	Position and Names	1	2	...	30	31	Total	Total
1									
2									
3									

FIG. 2—FORM FOR SHEET USED IN TIME BOOK

STEEL MANUFACTURING CO.....WORKS
SPECIAL ALLOWANCE AUTHORITY

General Superintendent:- .....192.....
Please authorize special allowances as follows:-

..... $.....
.....
.....
Reason.....
.....
O.K.....Approved.....Entered.....
Dept. Sup't. Gen'l. Sup't. Payroll Clerk

FIG. 3—AUTHORITY FOR SPECIAL ALLOWANCES

number of men to a turn. The timetaker should use the period (.) to designate the day turn and the caret (^) for the night turn. When he makes his trip of inspection in the morning, he will place in the square for that date, opposite the employe's name and check number, a period which denotes day turn and that only one inspection has been made. When he makes his trip in the afternoon he will place in the square the number of hours called for by the wage scale for the particular kind of work done in that department. For instance, we may have the following: /8, which means that the man worked eight hours, day turn. If this man works overtime, the foreman will turn in a record of it on his daily report.

The timetaker's report may show 2/8, which indicates that the employe worked 10 hours, day turn, eight regular and two overtime. If the employe works on through the night and makes a double turn, the night timetaker will note this time on his tour.

The timetaker on night duty will make two tours, seeing his men about 9 o'clock and 4 o'clock, next morning.

All men who work in the shops or mechanical department are under a foreman and assistant foreman. At the end of each day, the foreman or his assistant makes up a foreman's time card as shown in Fig. 5. The report is turned in each day to the payroll clerks who check them with the timebooks. If any discrepancies are found, an inquiry is made to determine the right time. The gateman's report also is checked against the timebooks and the foreman's reports. Under this method it is hard for an employe to get credit for time that he is not entitled to, and if a man is entitled to more time than one report shows, the other will give the correct time. For gang labor the foreman is furnished with a gang distribution book as shown in Fig. 6. On the gang distribution sheet, the employe's check number is listed, and the number of hours worked on each job. The foreman will make a distribution of the labor by giving a brief description of the work done that day.

When these sheets are turned into the distribution clerk each day, he makes a distribution of the labor by accounts, numerically, which serve as the original journal entry to the cost sheets or labor accounts. These distribution sheets are checked against timebooks and the gateman's report.

STEEL MANUFACTURING CO.....WORKS

FOREMAN'S TIME REPORT

Name.....Check No.....Dept.....Date.....192..

DESCRIPTION OF WORK	ACCOUNT	HOURS
	TOTAL	

Correct
.....FOREMAN
PER.....
(Name in full)

FIG. 5—FOREMAN'S TIME REPORT

STEEL MANUFACTURING CO. . .....WORKS

AUTHORITY FOR CREDITING TIME OF ABSENTEES

CHIEF CLERK:
You are hereby authorized to pay salary or wages of absent employes as follows:-

NAME.....CHECK NO.....
POSITION.....DEPARTMENT.....
RATE.....PERIOD OF ABSENCE.....192...
CAUSE.....WERE EARNINGS INCREASED.....
NUMBER OF DAYS INCREASED.....AMOUNT.....

CORRECT APPROVED

....
Department Superintendent. General Superintendent.

ENTERED

.....
Payroll clerk

FIG. 4—AUTHORITY FOR CREDITING TIME OF ABSENTEES

Every employe, in addition to a rate card, must have a payroll ledger card. Under the heading of date, the year, month and day are entered. Under the heading of credits, the book letter is entered, such as "A," which indicates that this employe's name will be found in payroll ledger "A." In the next two columns the amount of earnings for the first and second two weeks are entered, and in the last column the total gross earnings are entered. Under the heading of debits, deductions for coal, stock or clothing furnished to the employe, and any other charges, are entered and totaled in the last column, and this figure is deducted from the gross earnings, leaving net earnings. Under a column headed "Number" in the pay statement, the voucher number is entered.

All payroll ledger cards are filed away

STEEL MANUFACTURING CO.
Distribution of Gang Labor

.....Works.....Department Date.....192....

	Check No.	Hrs.	Check No.	Hrs.	Account	Hrs.	Description of Work
1							
2							
3							
20							
21							CORRECT
22							Foreman
23							
24							Total Hrs....
25							
26							PER CHECKED
27							(Name in full) Dis.Clk.
	TOTALS						

FIG. 6—FORM FOR RECORD OF DISTRIBUTION OF GANG LABOR

STEEL MANUFACTURING CO.
NOTICE OF CHANGE OF STANDARD FORCE

GENERAL SUPERINTENDENT:-
You are hereby notified that I have | increased force.....men.
| decreased

Department.....Position.....
Rate.....Per.....Commencing.....192.
Length of time.....
Cause.....
.....
.....
O.K.....APPROVED.....ENTERED.....
Dept. Supt. Gen. Supt. Payroll Clerk

FIG. 7—NOTICE OF CHANGE IN SIZE OF WORKING FORCE

in numerical order of check numbers. Each payroll clerk has a certain section of the payroll to compile. The timebooks are divided in sections to correspond with the payrolls, such as A, B, C and D. The clerk who has payroll A must have timebook A and all payroll ledger cards for that section of the payroll. Each payroll clerk will transfer the time from the timebooks to the payroll sheets the day following, keeping one day behind actual operations at all times.

When an employe is absent from the plant for 30 minutes or more, on duty, his department superintendent must fill out and sign a card for crediting him with time as "Absence on Duty." A form of this absence card is shown in Fig. 4. This is authority to the payroll clerk to credit the employe named thereon with time while absent from the plant on duty.

In addition to the absentee card there is a special allowance card which serves as authority for crediting an employe with extra compensation for working overtime outside of his department on special work. This form is shown in Fig. 3.

At the end of the month all absentee cards and special allowance cards are filed with the employe's rate cards until after the payroll auditor has audited all payrolls for that month, then they are taken to a record room and filed numerically.

If a payroll ledger card is removed from its file for any purpose, during the current month or after it has been filed in the record room, a small card is inserted in its place showing the card number, check number, name of employe and the name of clerk that removed the card, and his department. When the card is returned, the substitute is destroyed.

After all payrolls are made up and thoroughly checked they are turned over to the paymaster, who then makes up the pay envelopes and the pay register.

As soon as possible before payday the payroll clerks take their respective section of the payroll and post the necessary entries to the payroll ledger cards, showing the amount of earnings, and extend the net earnings so the paymaster may make up the envelopes.

Not every manufacturing company sells coal or other goods to employes but a great number of steel companies do, and it is necessary to have the proper forms available. The form should be very complete, as it is always necessary to have a full line of information why the employe wants the coal, where he lives and whether he wants it delivered to his home. Owing to the fact that this coal is sold to the employe at a price lower than that of the retail market, he may attempt to divert the coal to commercial purposes. The writer submits a form as shown in Fig. 8 that may be used in connection with the orders and deliveries of coal to employes.

Every manufacturing company or steel industry of any size has what is known as a wage scale. This wage scale is approved by the officers of the company and it sets up the rates that shall be paid for the different classes of work and positions. It also gives the size of the force for the standard positions. The wage scale is revised and reconstructed when conditions warrant a change. Sometimes a temporary change in a rate is needed to increase or decrease wages paid for a certain kind of work. To make this change it is necessary to have the proper authorization and this must come from the general superintendent and the department superintendent. In Fig. 9, we have a form that may be used for this purpose. All "permanent changes" remain in effect until a new wage scale is made up.

All positions in all departments are covered by a "force report," giving the name of the position and the number of men permitted on that kind of work, and the number allowed to work in the department. It shows the number of hours that each shift should work in each department named. Like the wage scale, the force report needs to be changed occasionally and it is necessary to have the proper form for the authority.

A form of card to be used for this is shown in Fig. 7.

The change may be an increase or de-

STEEL MANUFACTURING CO.
NOTICE OF CHANGE IN WAGE SCALE

GENERAL SUPERINTENDENT: Sheet No.....Line No.....
You are hereby notified that I have changed scale | permanently.
| temporarily.

Department.....Position.....
Date.....192...
CHANGED FROM CHANGED TO
Hours per turn..... Hours per turn.....
Rate.....per..... Rate.....per.....
Force-Reg.....Sat.....Sun.... Force-Reg.....Sat.....Sun.....
Length of temporary change.....
Why changed.....

O.K.....APPROVED.....ENTERED.....
Dept. Supt. Gen. Supt. Chief Timekeeper

NOTE: Saturday and Sunday forces need not be shown on positions entirely controlled by operations of mills, furnaces and etc.

FIG. 9—NOTICE OF CHANGE IN WAGE SCALE

STEEL MANUFACTURING CO.
EMPLOYE'S COAL ORDER

Order No..... .....192.....
Delivery No.....
GENERAL SUPERINTENDENT:

Please furnish.....Check No.....
Address (Check Address).....
The following.....
When wanted.....Present supply will last.....
Married or single.....Board or live at home.....
Dependents.....If so, whom.....
If not head of family, why is coal ordered.....

APPROVED.....APPROVED.....
Department Superintendent Chief Timekeeper
Date of last load.....Address delivered to.....

APPROVED.....COLLECTED.....
Storekeeper Payroll Clerk

APPROVED: Coal Examiner.....

FIG. 8—FORM FOR DEDUCTION FOR SUPPLIES FURNISHED TO EMPLOYES

crease in force and this would have a direct bearing on the number of direct labor hours worked on that position or job number. The force and check numbers must be entered on the payroll sheet. A form of payroll ledger sheet is shown in Fig. 10. All overtime is shown on this sheet, in small red figures right over the straight time. The total overtime is shown separately from the total straight time. In the column next to the column for time, is shown the total tons credited to the employe, where the tonnage rate is used in addition to the time method. Next is the money column which shows the total gross earnings.

Malleable Iron Melted in Oil Furnace

(*Concluded from Page* 34)

the furnaces are 11 and 12 tons. The amount of oil used varies little in proportion to the charge, but may in some instances be at the minimum figure while operating the furnace at capacity. Our best record for oil consumption was the melting of 781.6 tons of iron with 43,674 gallons of oil, an average of 55.8 gallons per ton. This was made over a three weeks' period and includes the total melt of three furnaces.

The average for four furnaces for the past 4 months is approximately 65.0 gallons per ton. This means a fuel cost of about $3.50 per ton of metal melted. A comparison with coal, for one day's operation, on this basis would be about as follows on furnaces melting two 10-ton heats:

	Oil	Coal
Fuel cost	$70.00	$77.80
*Operation	6.00	10.80
One laborer hauling coal.	....	3.50
Ash removal	....	0.50
Total	$76.00	$92.60

*One operator on oil, two firemen on coal.

A much larger saving is made on maintenance of the furnace. On 8-ton heats over a period of 203 oil heats, and 126 coal heats, maintenance cost was $3.01 per ton in the case of oil, and $6.56 per ton while firing with coal.

An average of 6 bungs are relined each 11 heats. The life of side walls is about 40 per cent longer than when coal was used.

Studies Preparation of Sponge Iron

The study of the preparation of sponge iron is being continued at the Northwest experiment station of the bureau of mines, Seattle. The object of the study is to develop a method by which sponge iron can be made by using low grade coals and iron ore in a direct-fired, rotary kiln. The sponge iron will be prepared with a view to utilizing it in the production of foundry iron and steel, and for the precipitation of copper from solutions resulting from leaching operations. Tests will be made in a semicommercial size furnace that will treat about a half a ton of ore per day. Attempts will be made to increase the rate of reduction of the iron oxide by adjusting the operating conditions of the furnace and the conditions of the charge.

Concentration studies will then be made on a product with a view to obtaining a high grade sponge iron suitable for melting in an electric furnace, or for use in precipitating copper from solution.

To Investigate Cause of Mine Explosions

Factors causing mine explosions will be studied at the Carnegie Institute of Technology, Pittsburgh, according to an announcement outlining a program of research on coal mine problems. The study of mine explosion causes will be divided into investigations as follows: Modification of Stokes law for settling coal dust particles; time-pressure relations in dust explosions; conductivity and specific heat of coal; static charges in coal mines; and effect of electric field in propagation of explosions.

Six college graduates will be appointed to research fellowships to conduct the investigations in co-operation with the bureau of mines and an advisory board of Pittsburgh coal operators and mining engineers. Other subjects for investigation during the year will be geology, acid mine waters, coal mining, coal washing, utilization of coal, safety, and coal storage.

Studies Oxygen Recovery from Iron Oxides

Tests conducted at the bureau of standards, Washington, on the completeness of recovery of oxygen from oxides of iron and silicon in the vacuum fusion method for gases and metals have indicated complete reduction and recovery in both cases. Other oxides which may be present in steels now are being tested. Through the co-operation of a manufacturer of malleable cast iron, some tests have been made recently which indicate that results for oxygen by the Ledebur method on white cast iron are of little value because of the surface oxidation of the sample during its reduction to a finely divided form. The apparent oxygen content of the metal as a fine powder is about 100 times, and as a coarse powder about 50 times the true oxygen content of the material, as given by vacuum fusion analysis on a solid sample.

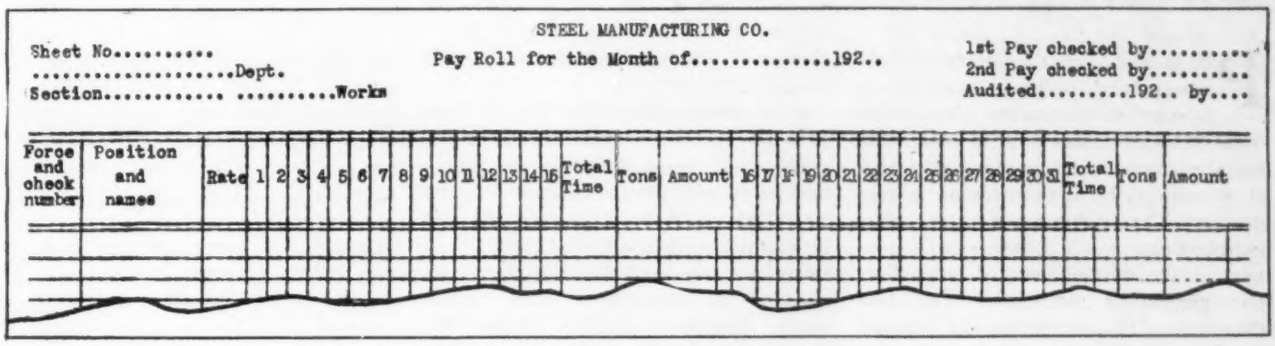


FIG. 10—FORM FOR PAYROLL LEDGER SHEET

Buys Furnace Company

The Electric Furnace Co., Salem, O., has been organized to purchase the assets of a former company of the same name from the trustee in bankruptcy. B. A. Hoiles, Alliance, O., is president of the new company and owns the majority stock. R. F. Benzinger is vice president and sales manager while F. T. Cope who was with the old company for 12 years is treasurer and general manager. The company will construct electric melting and heat treating furnaces of the resistance type.

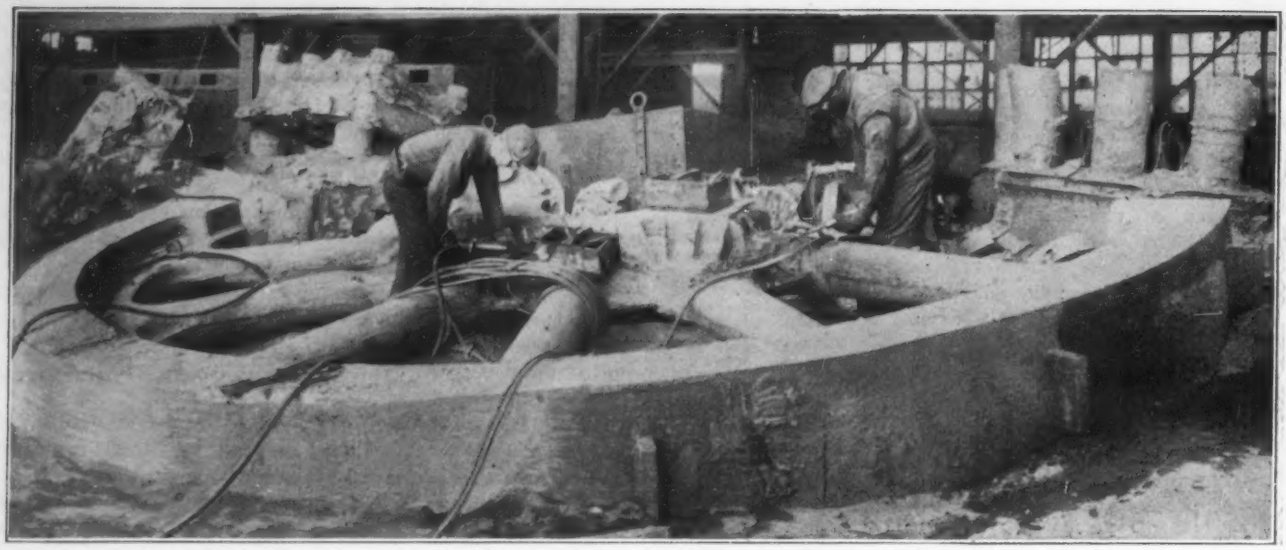


Fig. 1—Ten of these sections are required in the construction of an 87,000-horsepower generator

Casting Heavy-Type Generator Castings

PROGRESS in the electrical field has carried with it many interesting developments in other lines. One of these is in the steel foundry, an unusual product of which is shown in the accompanying photographs. The General Electric Co., Schenectady, N. Y., has been a pioneer in the development of large electric generating machinery. The tendency in the generation of electric power throughout the country is more and more towards consolidation of small plants and the use of larger individual generating units. Although scarcely dreamed of some years ago, the building of 50,000-horsepower generators is not unusual at the present time.

The casting shown in Fig. 1 is a part of the rotor of an 87,000-horsepower unit being built at the Schenectady works of the General Electric Co. This is a steel casting 21 feet in diameter when finished, and 10 of them are required in the construction of a single generator. Each single completed casting weighs approximately 54,000 pounds which gives a total of 540,000 pounds as the weight of the 10 castings used for a single machine. As may be supposed, the foundry problem of casting these large steel sections is a difficult one. In the first place the question of steel melting capacity sufficient to pour such a large casting must be met. As poured, the casting together with headers weighs approximately 84,000 pounds.

To secure furnace and ladle capacity to pour this heavy tonnage and also for other reasons incident to the general steel foundry practice, the General Electric Co., has turned to its modern steel foundry at Everett, Mass., for the production of these castings. Here the problem of molding and pouring has been worked out carefully. The molds are completely made up of baked sand segments

FIG. 2—APPROXIMATELY HALF OF THE STEEL MUST BE CUT AWAY BEFORE THE CASTING IS FINISHED

FORGE HAVING HEARTH BUILT IN ONE PIECE

which strictly speaking are cores. Thus from a technical standpoint no molds are used, the sections being core poured.

A large surface on the floor of the foundry is smoothed off and tamped perfectly level. Then on this is built up the segment core structure into which the metal is poured. Each segment has two gates and the metal is poured simultaneously from two ladles, one into each of the gates. The work of preparing the mold and the cores for each section takes about five days. When the complete mold is all well weighted and ready to receive the metal two furnaces in different parts of the shop are tapped and the ladles each carrying about 22 tons of molten steel are brought to the mold and the casting is poured.

Fig. 2 shows one of the castings just after it has been lifted out of the sand. The heavy headers required to prevent shrinks are shown clearly. From this point on the problem is one of cleaning. It requires five men five days to cut off the headers and clean the casting. The photograph in Fig. 1 is the same casting as that shown in Fig. 2 after about four days' work of cleaning. These castings are shipped from Everett to Schenectady on flat cars, one casting to a car, thus 10 cars are used to transport the complete rotor for one generator.

Constructs Rivet Forge of One Piece

The Buffalo Forge Co., Buffalo, recently has introduced a rivet forge having the hearth constructed of one piece of metal. A front view of the new forge is shown in the accompanying illustration. This one-piece hearth is perfectly formed with rounded corners and rolled top edge upon which tools may be rested. It is claimed that this forge in conjunction with a blower manufactured by this company will give a maximum amount of air with small effort, and will last for a period of years.

Builds Automatic Machine To Surface Parts

A grinder that can automatically surface such parts as thrust washers, clutch disks, bearing races and other parts that can be individually or collectively chucked within a diameter of 12 inches, recently has been introduced by the Williams, White & Co., Moline, Ill. This device is primarily a production machine designed to remove a large amount of metal in a short time. A view of the new machine is shown in the accompanying illustration.

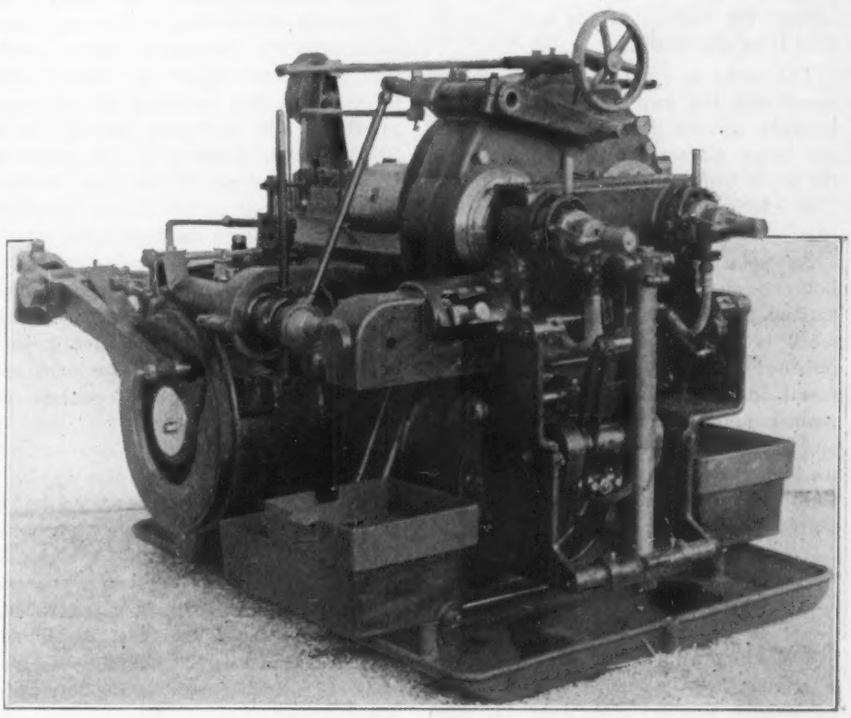
The grinder automatically completes one cycle after the work has been chucked and the machine started. After the machine is started a cam raises the rotary chucks to a horizontal position and locks them. Further rotation of the cam advances the abrasive wheel toward the work. The heavy cutting is accomplished in the first fraction of the cycle, allowing ample time during the remainder of the cycle for the wheel to cut itself free. On completion of the cycle the chucks automatically drop to the loading position and the machine stops. It is claimed that the automatic features of this machine make it possible to operate with comparatively unskilled labor.

For the purpose of cooling a large stream of liquid is pumped through the wheel spindle while an additional stream of liquid is run through each of the work spindles. Water introduced in the rapidly revolving wheel spindle cascades over the rim of the wheel at a sufficient rate to prevent the wheel from loading.

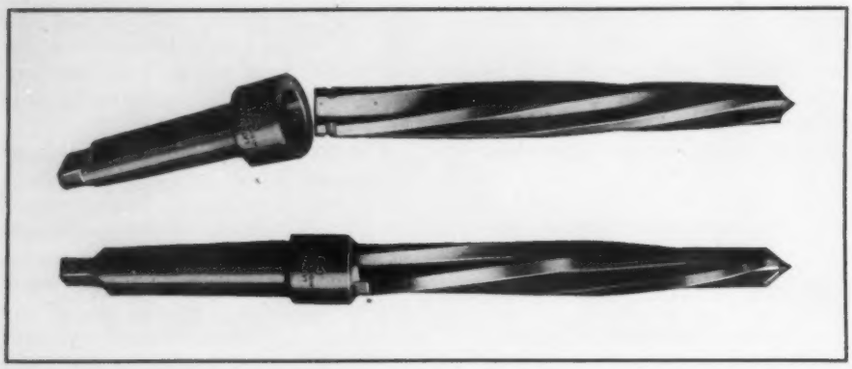
Cylinder wheels 20 inches in diameter are used. The depth of the rim thicknesses are varied to suit the parts ground. The wheel is advanced to compensate for loss of grinding and dressing by means of a hand wheel, which is calibrated to 0.001 of an inch. Either mechanical rotary chucks, pneumatically or hand operated, or magnetic chucks are used.

The time required for one cycle is from 20 seconds to 2 minutes.

The bureau of standards, Washington, is about to undertake an investigation of the possibilities of using nondestructive methods for testing wire rope with special reference to hoisting rope. Present methods of inspection are unsatisfactory and do not unfailingly tell when it is necessary to remove the rope from service. The object of this investigation is to develop, if possible, some method by which an actual test can be made to determine the condition of the rope with respect to its deterioration in service, without destroying it.



GRINDER AUTOMATICALLY SURFACES PARTS



HIGH SPEED REAMERS HAVING SHANK FASTENED ON BY SPECIAL PROCESS

Develops Line of Bridge and Boiler Reamers

A new line of speed bridge and boiler reamers recently has been introduced by the Latrobe Tool Co., Latrobe, Pa. Two views of the reamers are shown in the accompanying illustration. These tools are made in both five flute straight and four flute spiral types, and can be furnished in either bridge reamer length or short car reamer length.

The body of the tool is made from a bar of high speed steel rolled to a proper profile to form the flutes when the bar is twisted. The body is machine finished and hardened before being assembled in the carbon steel shank. The shank is fastened on by a special process. A hole is drilled in the end of the shank the proper size and depth to receive the end of the reamer. The shank is chucked in a high powered lathe, the reamer inserted in the hole and the tail stock center is brought firmly against the point of the reamer to keep it firmly against the bottom of the hole and to hold it in alignment.

The lathe is run at a high rate of speed and the two spinning tools are brought against the opposite sides of the large diameter of the shank over the place where the joint is to be made. The friction heats the shank to a red heat.

As soon as the shank metal is hot enough to work, more pressure is applied to the spinning tools while the work is rotating at high speed. The outside diameter is reduced and the metal in the shank flows around the reamer body and keys in the notches and flutes. Shrinking of the shank from its higher temperature makes the joint tight, and only finish grinding is required to complete the tool.

Manufacturers Elect

The Hartford County Manufacturers' association held its annual meeting at the Farmington Country club, June 14, when the following officers were elected: President, Mitchell S. Little, Hartford; first vice president, A. Buol, New Britain; second vice president, S. E. Horton, Windsor Locks; treasurer, State Bank & Trust Co., Hartford; governing board, Howell Cheney, South Manchester; Samuel M. Stone, C. B. Whittlesey, Clarence E. Whitney, C. T. Taylor, C. D. Rice, B. M. W. Hansen, D. H. Thomson, C. B. Cook, J. M. Merrow, F. C. Billings, B. H. Blood, M. S. Little, C. H. Baldwin, J. F. Lamb, C. F. Bennett, F. F. Barnes, A. C. Harper, S. S. Gwillim, F. N. Wells and Arthur Coughlin. President Little resigned soon after his election and the vacancy will be filled by the governing board.

Latin America Buys More Steel and Machinery

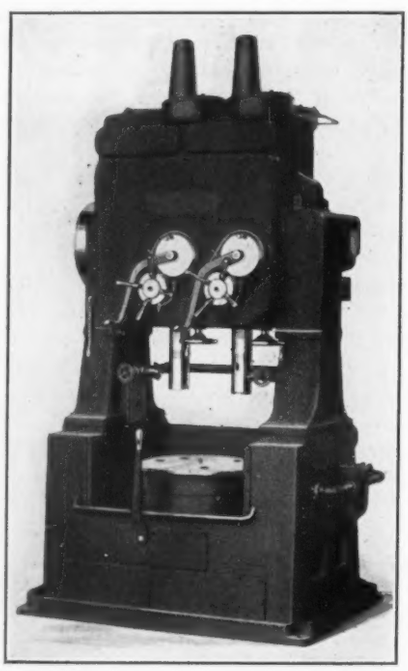
Against propaganda to the effect that American business with Latin America is fast falling off, Dr. Julius Klein, chief of the bureau of foreign and domestic commerce, points out that in the 10 months ended with April, as compared with the 10 months ended April, 1922, American exports of barbed wire to Argentina had increased 121 per cent, to Brazil 310 per cent and to Chile 305 per cent. Exports of tin plate to Cuba had gone up 155 per cent, to Argentina 270 per cent. Galvanized sheet and wire exports increased in much the same degree, according to Dr. Klein, while in the first quarter of 1923 exports of industrial machinery to Cuba, Argentina and Brazil had advanced 31, 143 and 44 per cent respectively, over the first quarter of 1922.

Introduces New Heavy Duty Drilling Machine

For use in the production of miscellaneous parts such as hubs, gears, rollers, connecting rods, links, etc., the Foote-Burt Co., Cleveland, recently has developed a two spindle heavy duty drilling machine. A front view of the new machine is shown in the accompanying illustration. The machine may be used for drilling holes, or it may be employed for the performance of successive operations such as drilling and spot facing, drilling and reaming, etc. By using a multiple spindle auxiliary drill head on the spindle, the machine also is adapted to multiple drilling.

When it is desired to perform two similar operations a two station fixture mounted on the work table enabling two pieces of work in one fixture to be under the two spindles of the machine. For the above mentioned work the table can be indexed 180 degrees. Where successive operations like drilling and spot facing or drilling and reaming are performed, a three-station fixture is used which is indexed 120 degrees at each movement.

Power is provided by a single pulley which is furnished with a friction clutch operated by a lever. From the pulley shaft motion is carried through two sets of forged steel bevel gears to two vertical auxiliary shafts. Take-off gears transmit the power to a pair of forged steel helical gears, the second of which drives the spindle. Standard gears are provided in sets to furnish spindle speeds from 43 to 304 revolutions per minute. The mechanism for adjusting the rate of feed affords a range of from 0.006 to 0.168 inch per revolution. Power or hand feeds are provided. A centrifugal pump and reservoir are provided to assure a good flow of coolant at all times. A guard is employed at the front of the machine to prevent the coolant from scattering on the floor while the machine is in operation.



TWO-SPINDLE DRILLING MACHINE ON WHICH SUCCESSIVE OPERATIONS CAN BE PERFORMED

More Statistics Submitted in Basing Case

Chicago, July 3.—Statistical exhibits supplementing the figures already contained in trade reports are being placed before the federal trade commission in the hearing on the Pittsburgh basing point case which were resumed here June 27. The new exhibits contain figures showing production, shipments and consumption of steel from 1918 to 1922, inclusive. Their purpose is to furnish data for compiling a statement of the relation of production and consumption in the West.

Among the witnesses in the past week were A. E. Russell, secretary of the Interstate Iron & Steel Co. P. S. Fuller, of the J. I. Case Plow Co., Racine, Wis.; C. Heggie, president of the Scully Steel & Iron Co.; Philip Robinson, of the Gary Screw & Bolt Co.; W. D. Niedringhaus, president of the National Enameling & Stamping Co., Granite City, Ill.; W. D. Truesdale, of the Inland Steel Co.; Harry J. Miller, of the operating department of the American Steel & Wire Co., Chicago; A. C. Joachim, of the accounting department of the Steel & Tube Co., and Harold E. Gregg, of the order and shipment department of the Illinois Steel Co.

In each case oral testimony was to the effect that the exhibits were made up from monthly records kept by the mills or the steel consumer and tabulated for the purpose of the hearing. Mr. Niedringhaus testified as to his company's method of making quotations, which produced delivered prices sometimes at, sometimes above and sometimes below the Pittsburgh price, plus freight to destination. He testified that his company had trebled its producing capacity since 1912, principally because of the increased demand for steel in the West.

Mr. Miller placed in evidence a statement of steel shipments from the Illinois Steel Co. and other companies to plants of the American Steel & Wire Co. It was planned to complete the taking of evidence at Chicago by July 3, after which a further session will be held at Washington to dispose of a few minor points.

Plant Damaged by Fire

The plant of the Columbia Machine & Malleable Iron Works, 3303 Atlantic avenue, Brooklyn, recently was damaged by fire. The forging departments and the brass foundry sustained the greatest damage. A portion of the equipment of these two units was entirely destroyed. The company is contemplating no serious curtailment of production for the reason that additional equipment can be pressed into service. A temporary shelter has already been erected amid the ruins where the brass foundry has already recommenced operations. Plans are already under way to rebuild.

Collect Data on Malleable Castings Output

Washington, July 3.—Another line of research statistics pertaining to the iron and steel industry has been added by the bureau of census, department of commerce, through the compilation of figures relating to the production of malleable castings. The first figures prepared by the department of commerce on this product cover the manufacture of castings in May. The returns include only those castings manufactured for sale as such and does not include those used in the plants or finished and sold as other products. The data include the reported output of 85 establishments operated at 70.9 per cent of total capacity during May. Total production for the month was 61,950 tons, while total shipments were 60,221 tons and orders booked totaled 49,730 tons. The capacity of the 85 plants reporting was 87,419 tons.

Commission Car Ruling Hits Steel Companies

Washington, July 3.—Steel companies owning mines and railroad cars will no longer have an advantage over those companies not so equipped, by virtue of a recent ruling of the interstate commerce commission. The commission has ruled that the practice of assigning cars for railway fuel and assigning privately owned cars to mines is legal, with certain limitations, under the interstate commerce act. It declared unjust the unreasonable practice of railroads assigning privately owned cars, or system cars, or foreign line cars for railway fuel to bituminous mines, in excess of the ratable share contemporaneously distributed to the mines on the carriers' lines.

This decision was made in the assigned car case. Heretofore, in distributing coal cars, the railroads had not taken into consideration privately owned cars or cars allotted for railroad fuel. The railroads had delivered private and assigned cars and then had distributed the remaining cars on a pro rata basis. Henceforth the private cars and assigned cars must be lumped together with all cars. This ruling removes the advantage held by those steel companies possessing mines and cars. The commission has allowed the carriers until Sept. 1 to make new rules before making this decision effective.

1921 Brass, Bronze, Other Metals Output Small

Washington, July 3.—Production of brass, bronze, copper, other metals and alloys fell off considerably in 1921, not only in tonnage of output, but also in the size of the industry, according to statistics recently issued by the bureau of census, department of commerce. The number of establishments engaged in this industry decreased from 1092 in 1919 to 911 in 1921, the average number of persons engaged falling from 86,106 in 1919 to 48,712 in 1921. Total production in 1919 amounted to 641,183 tons or almost twice the decreased tonnage of 1921 which totaled 349,600 tons.

Societies News

THE twenty-third annual meeting of the Lake Superior Mining institute will be held on the Minnesota ranges Aug. 29-31. Headquarters of the institute will be at the Spaulding hotel, Duluth. A number of inspection trips will be made during the meeting. On Wednesday morning the members will visit the Minnesota Steel Co. The afternoon will be devoted to business sessions, the members leaving for Babbit, Minn., on a train leaving Duluth about midnight. Thursday will be devoted to visiting the plant of the Mesabi Iron Co., Babbit, and the mines at Virginia and Hibbing. A business session will be held at Hibbing, after which the visitors will leave for the Cuyuna range. The mines in the Cuyuna district will be visited on Friday.

* * *

Engineers Hold Picnic

The Association of Iron and Steel Electrical Engineers of Chicago held their annual outing at Michigan City, Ind., June 27. About 60 members made the trip by boat.

Convention Calendar

Aug. 20-30—American Institute of Mining and Metallurgical Engineers. Meeting at Quebec, Canada. F. F. Sharpless, 29 West Thirty-ninth street, New York, is secretary.

Sept. 10-14—American Chemical society. Fall meeting, Milwaukee. L. Parsons, P. O. box 1515, Washington, is secretary.

Sept. 17-22—Chemical Industries. National exposition, Grand Central Palace, New York.

Sept. 24-28—American Association of Iron and Steel Electrical Engineers. Convention and exhibition. Auditorium, Buffalo. Headquarters of the association are located at 1007 Empire building, Pittsburgh.

Sept. 27-29—American Electrochemical society. Annual meeting at Dayton, O. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Which Way Is Business Headed?

Problem of Overproduction Looms Prominently—Part of Spring Revival Due To Making Up of Depleted Stocks—Pig Iron Gains 348 Per Cent Over 1921 Low —Peak Outputs Not Likely To Be Maintained Indefinitely

BY JOHN W. HILL

MANY authorities believe that the curtain will be rung down upon the present period of prosperity by an overproduction of goods. For that reason the problem of production is looming large in current economic discussion. It involves two considerations.

One is the extent to which the great unprecedented industrial activity of this spring was for the purpose of making up accumulated shortages and how nearly this process is completed.

The other is to what extent, if any, current outputs are in excess of current requirements and purchasing power.

One important fact has been well established by economic experience. This is that in time of depression the production of goods declines much more rapidly than consumption. Mass consumption, it is estimated, never rises or falls more than 5 or 8 per cent above or below the normal line. Manufacturing activity, however, varies from 15 to 30 per cent from normal.

In 1921 the extreme curtailment of production relative to consumption created large shortages of goods. This was true in many manufactures and in building construction. These depleted stocks and the pressing needs for building gave the first impetus to the recovery in 1922.

Revival made steady progres last year, but it reached great peaks of activity early in 1923. Production in 22 basic lines in May, as measured by the federal reserve board, showed an increase of 70 per cent over the bottom of the 1921 slump. The month's record was 10 per cent greater than the top of the 1920 boom.

Clearly much of this gain was to replenish stocks. How far this has gone adequate data are lacking. There is much evidence to indicate, however, that in many lines the process is nearing completion. Outputs of many industries this spring have ranged from 5 to 100 per cent greater than estimated normal consumption. In only a few, however, has production been overdone to the extent of creating heavy accumulations of excess stocks. In most industries, all available evidence tends to show large inventories are conspicuously lacking. The memories of 1920 are too fresh for the repetition of that folly.

The author is financial Editor of IRON TRADE REVIEW.

Business Series Continue

THE accompanying article by Mr. Hill is the second of a series of studies of the present complex business situation. The first appeared in the June 28 issue. In the July 12 issue the common and similar points of present conditions and those of 1920 will be analyzed. In the July 19 issue the economic position of the farmer which has such a large bearing on the movement of general business will be presented. The final article in the July 26 issue will be devoted to a summary of the whole situation and of the probable future trend.—THE EDITOR.

What Pig Iron Shows

Pig iron production has come to be regarded as a fairly reliable thermometer of conditions in general industry. Sometimes it falls too low or rises too high, but in a broad sense it reflects the state of economic health. At the low point of the depression in July, 1921, the output of iron had shrunk to about 20 per cent of blast furnace capacity. From this level the subsequent recovery has brought a tremendous gain of 348 per cent. Obviously this increase was out of proportion to the rise in the contemporaneous consumption of iron.

In May, 1923, the blast furnace production was 14 per cent greater than at the peak of the boom in March, 1920. This increase is a normal one for pig iron to make following a sharp reaction. Three periods of depression and subsequent recovery are pictured in the accompanying chart. Taking the peak of the boom period as 100 it is found that in 1894 iron output declined to 33 per cent of the preceding high point in March, 1892. In December, 1895, it recovered to 16 per cent above the March, 1892, peak.

In October, 1907, the pinnacle of the pre-panic expansion was reached. By January, 1908, the output of iron was only 45 per cent of what it had been in October. The subsequent expansion reached its climax in February, 1910, when the daily average output was 13 per cent higher than in October, 1907. In the recovery of 1900 pig iron production was lifted 35 per cent above the peak of the preceding boom in 1895.

The gain over the low point at the top in 1895 was 250 per cent. In 1909 the corresponding gain was 150 per cent. The increase over the low point of 1921 has exceeded these gains but it may be noted that the recent depression in iron and steel relative to capacity was the most drastic in modern times.

Clearly enough in the light of past records there has been nothing abnormal in pig iron's rapid expansion this year. At no period however, has pig iron activity ever remained for many months at the peak following a depression. It probably will not do so this year. Already blast furnace activities are beginning to recede, though only slightly. Usually in the past the decline from recovery peaks has been gradual, with normal output holding well above the normal of preceding years.

The fluctuation of pig iron and steel in the coming months will depend upon the conditions affecting large steel consumers. Most important of these are the building, petroleum, railroad and automobile industries. The outlook in these industries does not justify expectation for peak outputs of pig iron and steel indefinitely. However, they do justify expectations of large scale activities for some months to come. Declines in demand from some sources probably will be made up by increased buying from others.

The building industry is experiencing a decline in future plans. The peak of actual operations will not come, however, until fall and the effect of such recession will not be felt in the steel industry immediately. Moreover the decline is largely confined to residential building. Industrial building, large construction projects and road building have not declined.

Much interest surrounds the automobile outlook. The motor car has been the industrial wonder of the age for nearly two decades. This year it has broken all production records month after month. For the five months ended with May the output totaled approximately 1,650,000 cars. The May output was 393,000 passenger cars and trucks. This was at the annual rate of nearly 4,800,000 cars.

How long can this immence production continue? A week or so ago one of the best informed authorities in the motor industry told the writer that the aggregate output of cars in 1923 would not exceed 3,000,000. This would be 12 per cent greater than the 1922 high record of 2,659,000 cars.

However, the final count of only 3,000,000 cars for 1923 would mean a curtailment of output during the last half of the year of nearly 50 per cent from the high level of activities reached in May. Some authorities believe the output will exceed 3,000,000 cars and that production will not be cut so large as the above estimate implies. All are agreed, however, that some curtailment, on a larger scale than normal seasonal summer letdown, is probable. One of the principal troubles of the automobile industry has been some overproduction of open cars this spring. This was partly due to the late spring and the large popular demand for closed models. The enormous surplus of used cars is an unsolved problem in the industry. Moreover, many companies are finding it increasingly difficult to make profits in the face of rising costs and the large competition which makes price advances impractical.

Part of any loss of iron and steel tonnage from the automobile industry which uses approximately 9 per cent of finished steel output probably will be made up by increased demand from the railroads. With unprecedented traffic the roads are showing earnings at the highest rate since the resumption of private control. Their credit has been largely restored. During the recent stock market liquidation rail shares have stood relatively firm, compared with extreme declines for industrial stocks.

The roads are spending nearly $1,000,000,000 this year on improvements. Their needs are vast. While industry was expanding about 35 per cent since 1913, the facilities of the roads have barely kept even with the prewar condition. Last year 180,000 cars were purchased and about 80,000 more have been ordered so far this year.

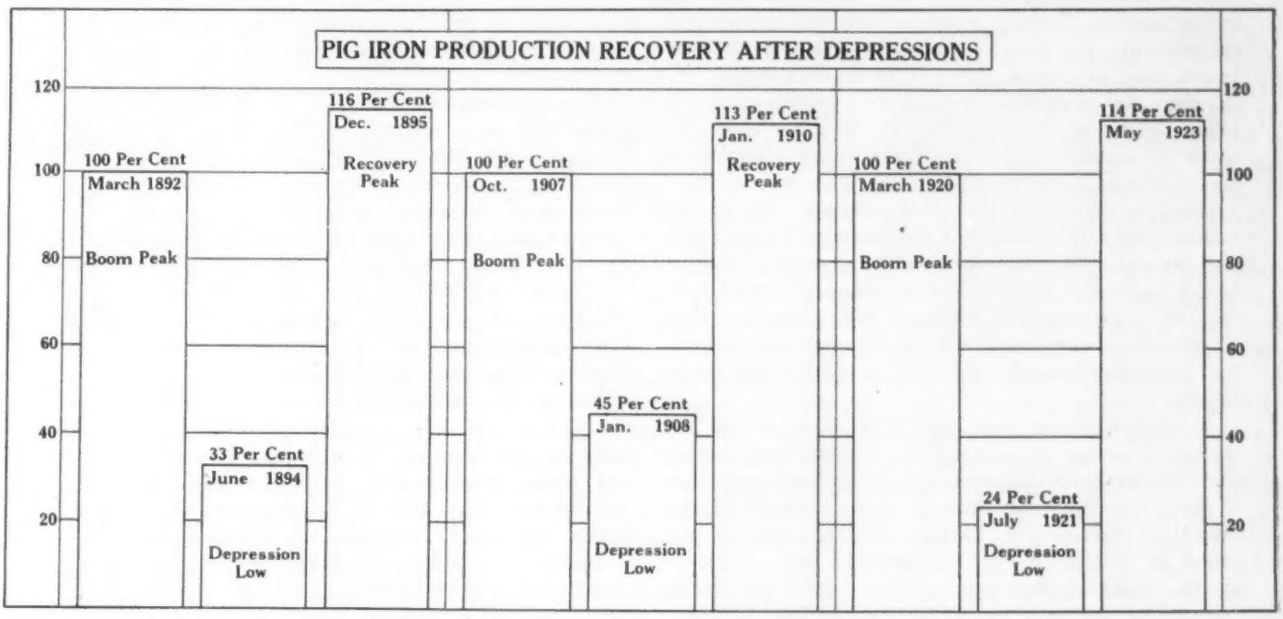
It is estimated that the roads must buy around 200,000 cars annually for some years, in order to provide for replacements and for the growth of the country. The increase in equipment and greater efficiency has enabled the roads to perform a supposedly impossible task this year. They have handled an unprecedented spring traffic and at the same time have overcome the shortage of cars. As a result the requirement for cars is less pressing. The need for locomotives and trackage is enormous, however. The total mileage of railroads in 1922 was no greater than that in 1913.

In the petroleum industry, which with gas and water consumes 14 per cent of finished steel output, conditions are unfavorable at the moment. Output, due to the large increase in California production, is 40 per cent greater than one year ago. This is partly offset by falling Mexican production. Nevertheless it has created large overproduction. All efforts to check it have been unsuccessful. Fundamental conditions in the petroleum industry are sound, however. Consumptive needs are enormous, and while some temporary adjustment may be necessary, the industry will continue a large user of steel.

Export demand for iron and steel has shown some increase. General merchandise exports have been falling, however. Slackened European demand for copper, cotton, wheat and meat products has reacted on these markets. This reflects weakened purchasing power abroad. Outside of Germany, however, economic conditions are distinctly on the mend. This should mean stimulated demand for American products later in the year. It is well to recognize that the stimulation of the great war and postwar foreign demand has been definitely eliminated as a factor in the consumption of American production. The settlement of the Ruhr problem would have the effect of a boom on world trade, but the outlook for this is not hopeful.

Authorities are far apart upon the question of the country's ability to continue to absorb goods at the current rate of output. Herbert Hoover

(*Continued on Page* 59)



THE FIRST COLUMN OF 100 PER CENT IS TAKEN AS THE BOOM PEAK. THE OTHER COLUMNS SHOW THE PERCENTAGE RELATIONS OF THE BOTTOM OF THE FOLLOWING DEPRESSION AND THE TOP OF THE SUBSEQUENT RECOVERY TO THE BOOM PEAKS

MaterialTestingToBeBroadened

American Society for Testing Materials in Annual Convention Would Obtain More Complete Specifications on Engineering Materials—Plans Proposed for Greatly Extended Research—Only a Few Specifications Are Modified

NECESSITY for more information regarding materials was emphasized at the twenty-sixth annual meeting of the American Society for Testing Materials, held at the Chalfonte-Haddon Hall hotel, Atlantic City, N. J., June 25-29. Inadequacy of present testing methods was indicated by committee reports and papers on magnetic testing, endurance testing, and determination of gases in metals.

George K. Burgess, the new director of the United States bureau of standards, in his presidential address, at the session Tuesday evening, June 26, emphasized the necessity for more research work by the different committees to obtain more definite information regarding the materials for which specifications are being drawn by the society. He also surveyed the trend of standardization in industry and emphasized his statement that standardization does not restrain advance in any branch of human economy, but on the contrary liberates energy for improvement in materials and methods. He reported that the executive committee of the society has decided to organize a committee to make a survey of the situation and to devise a plan of procedure which will develop the latent possibilities for organized research which exists within the membership.

A marked honor was conferred upon Arthur N. Talbot, professor of municipal and sanitary engineering, and in charge of theoretical and applied mechanics at the University of Illinois; past president of the American Society for Testing Materials and of the American Society of Civil Engineers, and a member of the National Research council. After the presidential address, Tuesday evening, Mr. Talbot was escorted to the platform and honorary membership in the society was conferred upon him for his distinguished work in engineering materials. Only three other members now hold this honor.

Interesting points in the report of the executive committee include a table of membership which showed an increase of 188 members during the past year, bringing the present membership of the society to 3218. The importance of the society's publications was indicated by the statement in the report that sales of publications during the past year amounted to $18,259.83.

Minor revisions of standards as proposed by committee A-1 were adopted by the society in the following specifications: Open-hearth steel girder and high T-rail; structural nickel steel; structural steel for locomotives; structural steel for cars; welded and seamless steel pipe; boiler and firebox steel for locomotives; and boiler rivet steel. The tentative standards for boiler and firebox steel for stationary service; and steel plate for forge welding also were modified. New specifications for steel plates of a quality for forge welding were adopted as tentative.

Among the entertainment features provided during the convention were an informal dance and smoker following the meeting on Tuesday evening, and golf and tennis tournaments. Both the golf and tennis tournaments were held at the Seaview Golf club on Friday afternoon. A number of special features were arranged for the ladies, this being the first year that the society has provided entertainment for the ladies.

Would Expand Research Work of the Society

THE subject of research was brought up a second time at the meeting Wednesday morning when the secretary of the society, C. L. Warwick, read the annual report of the executive committee. Several members of the National Research council were asked to discuss the advisability of appointing a steering committee to direct the initiate research work by the different committees of the society. Dr. Burgess said the duties of such a committee should be to look around and find men adapted to research activities, and to secure centers, either governmental or at universities, where desired research could be undertaken. Dr. Talbot approved of the appointment of such a committee and said there is a need for further knowledge of engineering materials which can be gained only by concerted research.

William K. Hatt, professor of civil engineering and director of the laboratory for testing materials, Purdue university, said the duty of a committee as suggested should be to assemble and analyze information available, co-ordinate the work in the different fields, defining the fields, and to lay out a program, making recommendations for further work. W. M. Corse, chairman of the division of research extension of the National Research council, and F. E. Schmitt, secretary research committee, American Society of Civil Engineers, also favored the appointment of a committee for this purpose.

Steel Committee Reports

Carefully worked out in the committee of 144 members and presented by its chairman, F. W. Waring, the report of committee *A*-1 on steel elicited little discussion. Two new subcommittees were appointed, subcommittee XX on plate tolerances and subcommittee XXI on steel for welding. Subcommittee VIII on steel castings recommended a complete revision of the standard specifications for steel castings in which two classes of castings are provided for, as in the present specifications: Class *A* with chemical analysis only, and class *B* having both chemical and physical properties specified. Reference to pattern has been eliminated as being unnecessary in a material specification. Carbon for class *A* has been raised from 0.30 to 0.45 per cent maximum to bring this in agreement with current practice. Also ductility requirements for elongation and reduction of area have been increased to bring them in line with results now being obtained in modern practice.

J. R. Cain, bureau of standards, presented a report on ladle test ingot investigation. The work in this

investigation was carried on by himself, together with H. A. Bright and G. E. F. Lundell, both of the bureau of standards. The investigators found that about 20 types of ingots were being used, but that it would be possible to limit these to not more than three types. It was found also that many of the ingots were honeycombed with gas holes and that segregation was prevalent. By the addition of small percentages of aluminum to the steel, the gas holes were eliminated and the segregation was greatly reduced. Thus it was found that ingots treated with aluminum, due to improved soundness, permit a greater convenience in locating drill holes, and in securing drillings of uniform size free from scale and oxide.

Louis Jordan, chemist, United States bureau of standards, presented a paper on gases in metals, in which he called attention to the fact that although it is a natural assumption that metals prepared and treated in the same manner and having identical chemical composition should possess the same properties, this is not true in some cases. The cause of this variation, Mr. Jordan assigned to the fact that chemical analysis seldom includes the determination of the gases contained by the metals.

Three methods of determining the gases in metals, involving complete fusion of the metal, were used by the author in his experiments. A comparison of these three methods indicates that direct fusion of metal in a refractory oxide container, or the fusion of the metal with the addition of an alloy of antimony and tin does not yield as much oxygen as fusion of the same metal in contact with carbon. The author said the relation between solubility of gases in metal and temperature are somewhat different from the usual conceptions of the solubility of gases in ordinary liquids such as water. He adds that many observations lead to the conclusion that gases are dissolved in metals chiefly, if not entirely, in the intercrystalline cement.

Expect Valuable Information

While not a great deal has been done in analyzing metals for gases the author said studies of oxidation processes already have given interesting results. He pointed to the value of determinations of gases in pig iron, cast irons, steels and nonferrous alloys, and expects valuable information to be secured through a study of the effects of the different gases on these materials.

A written discussion of this paper submitted by H. A. Schwartz, manager research laboratories of the National Malleable Castings Co., Cleveland, maintains that tests have shown that no large amounts of oxygen exist in high carbon metals. While appreciating the value of oxygen determinations on some metals he said the apparatus required to make the test is so expensive as to be prohibitory to the smaller manufacturing plants, and in fact to all but the largest foundries and steel mills.

J. A. Apperle, chief chemist, American Rolling Mill Co., Middletown, O., in emphasizing the advantages of determining the gases in iron, said it had been determined that sheet steel with high nitrogen contents corroded much more rapidly than sheets with low nitrogen contents. He said oxygen, nitrogen and hydrogen tend to cause brittleness in sheet steel. He cited a case of sheet steel containing a high percentage of hydrogen. This was brittle, but when heated to 1000 degrees Cent. to free it from the hydrogen it became soft and pliable. Then when heated again to 1000 degrees and held there long enough to absorb oxygen it again became brittle. Also electrolytic iron heated in ammonia took up nitrogen and became brittle.

As indicating that the subject of gases in metal is not new, A. E. Outerbridge, William Sellers & Co., Philadelphia, said he had read a paper prognosticating that oxygen would be found in cupola cast iron, and this is published in the March, 1888, issue of the *Journal* of the Franklin institute.

The report of the joint committee on investigation of phosphorus and sulphur in steel indicated the vastness of the work to be done and included results obtained by the addition of sulphur to steel in the form of iron sulphide. No great effect was observed from the addition of sulphur, however, these high sulphur steels will be remelted in the open-hearth furnace to determine whether residual sulphur has a more marked effect than sulphur added to the steel in the ladle.

Testing Methods and Results Are Considered

REPORT of the committee on methods of testing read by C. L. Warwick, secretary, drew considerable discussion. This report included suggested methods of tension testing of metallic materials, and proposed tentatively definitions of terms relating to methods of testing. It was finally adopted with the understanding that the proposed methods and the tentative definitions would have careful consideration by the committee before the next meeting of the society.

Results and methods of various forms of testing of metals were discussed at the session Tuesday morning, presided over by D. M. Buck, metallurgical engineer, American Sheet & Tin Plate Co., Pittsburgh. The report of committee *A*-3 on corrosion of iron and steel, presented by H. E. Smith, engineer of tests, New York Central railroad, gave summaries of corrosion tests made in different parts of the country. All steel sheets exposed to the atmosphere in the Pittsburgh district have failed and this experiment is considered finished. The results showed that the presence of copper in all the various types of metal tested greatly increased their resistance to corrosion under atmospheric exposure. The same is indicated by the sheets exposed at Ft. Sheridan and Annapolis. The accompanying table gives a summary indicating the order of resistance of uncoated sheets to corrosion under atmospheric exposure as recorded for the various types of metals, together with average compositions, for the No. 22 gage sheets at the Pittsburgh location. The sheets are reported in order, the most resistant being the copper-bearing bessemer steel reported first. A coin-

Resistance of Uncoated Sheets to Corrosion

Rating	Type Designation	Average analysis, per cent					
		Car.	Man.	Phos.	Sul.	Sil.	Cop.
First	Copper-bearing bessemer steel	0.041	0.365	0.097	0.068	0.008	0.252
Second	Copper-bearing acid open-hearth steel	0.107	0.447	0.091	0.046	0.004	0.237
Third	Copper-bearing basic open-hearth steel	0.069	0.387	0.016	0.027	0.004	0.244
Fourth	Copper-bearing pure iron[1]	0.016	0.051	0.007	0.031	0.004	0.251
Fifth	Copper-bearing wrought iron	0.033	0.034	0.114	0.021	0.124	0.283
Sixth	Low-copper wrought iron	0.03	0.055	0.139	0.021	0.218	0.020
Seventh	Low-copper pure iron[2]	0.02	0.035	0.006	0.025	0.003	0.024
Eighth	Low-copper basic open-hearth steel	0.10	0.32	0.069	0.044	0.002	0.018
Ninth	Low-copper bessemer steel	0.038	0.386	0.089	0.040	0.007	0.014

[1]Average of groups C, U and V.
[2]Average of groups D, S and X.

cident is that the order of resistance of the copper-bearing metals is exactly reversed in the low-copper metals, and the bessemer steel is thus both the highest and the lowest in its resisting properties. The sheets were considered to have failed when a hole through which light could be seen developed, or when a corresponding deterioration was observed on the edge of the sheet.

Tests made of sheets totally and completely submerged in running water indicate that copper added to the metals does not become a factor in rust resistance under this condition. The committee reports that in response to a desire for some standard procedure for the sampling and analysis of metallic coatings on iron and steel a special subcommittee had been appointed to draw up tentative standards. These standards were accepted as tentative by the society. It was also reported that in outlining a program for new work tests of lead covered and zinc coated sheets will be considered.

The subcommittee on methods for determining weight of coating on iron and steel recommended the hydrochloric acid-antimony chloride method as standard for determining the weight of zinc coating on iron and steel products, and the basic lead acetate method and the sulphuric acid-permanganate method as alternate methods. This recommendation was accepted as tentative by the society. William A. Cooper, chairman, read the report of the subcommittee.

In discussing the report of the committee, Frank N. Speller, National Tube Co., Pittsburgh, called attention to the fact that seven times as long a time was required to produce failure in the domestic city water of Washington, as when the sheets were submerged in mine water, and emphasized the fact that any corrosion test indicates only what will happen under identical conditions.

A progress report was read by E. C. Lathrop, chairman of the committee on corrosion of nonferrous metals and alloys, indicating that the work of the committee is at present limited to the work of developing standard corrosion tests and determining their accuracy.

Magnetic Testing Is Discussed

The comparatively new subject of magnetic testing was thoroughly discussed by two committee reports and a paper which indicated the author's confidence in the importance of magnetic tests to the industry. A. V. de Forest, research engineer, American Chain Co., Bridgeport, Conn., in a paper on a new method of magnetic inspection, gave details of a magnetic test which he claimed would enable the operator to determine the effects of two different factors entering into the treatment of steel. At present when a steel is quenched and tempered the joint effect of these two treatments can be determined by other than magnetic tests, but the magnetic test, Mr. de Forest claims, enables the inspector to differentiate between the effects of the two operations. The apparatus was on exhibition during the convention and attracted much interest.

C. W. Burrows, chairman of the committee on magnetic properties, submitted methods of test for magnetic properties of iron and steel which were adopted as tentative by the society. A number of investigations were carried out by members of the committee. *A*-8 on magnetic analysis were included in the report of the committee read by F. P. Fahy, chairman. Mr. Fahy reported that the results thus far obtained were of a negative nature, but believed that important results will follow further investigation.

The importance of the endurance test to the development of materials for airplanes was indicated by two papers read on this subject. Results of an investigation made at the engineering division of the air service at McCook field, Dayton, O., to determine the endurance limit of duralumin bar stock as rolled, annealed and tempered, were included in a paper on resistance of manganese bronze, duralumin and electron metal to alternating stresses, presented by R. R. Moore. The paper brought out the fact that the endurance limit of nonferrous metals cannot be determined by applying 10,000,000 repetitions of stress, as in the case of most steels, but that tests of several hundred million repetitions are required. The endurance limits of metals tested are as follows:

	Pounds per square inch
Manganese bronze	15,000
Electron metal	17,000
Duralumin, as received	14,000
Duralumin, as received, tempered at 925 degrees Fahr.	12,000
Duralumin, as received, tempered at 700 degrees Fahr.	10,860

The investigation also showed that the endurance limits of nonferrous metals tested, in so far as they were investigated, do not bear any definite relation to physical properties. It also was found that a speed of 1500 revolutions per minute is above the critical speed for the metals tested.

H. F. Moore, professor of engineering materials, University of Illinois, in discussing the paper, said that the results of tests on nonferrous metals should not be applied to any but wrought metals. As an indication of the time required for endurance tests he cited a test which was started armistice day and not finished until Lincoln's birthday. Along the same line L. B. Tuckerman, engineer physicist, United States bureau of standards, said that the bureau has investigations of the effects of endurance tests outlined which will last 15 years.

D. J. McAdams presented an exhaustive paper giving results of an investigation of endurance properties of steel. These tests were made at the United States naval engineers experiment station, and give thorough data on the endurance of steel.

Chemical Requirements for Cast Iron Debated

CAST iron formed the center of interest at the meeting Tuesday afternoon, presided over by G. H. Clamer, past president of the society. Richard Moldenke, chairman of committee *A*-3 on cast iron presented a progress report indicating that the subcommittees are considering changes in the present tentative specifications for chilled iron car wheels, for pig iron, and for high test cast iron. In the latter specification a method of measuring the deflection between loads of 50 and 3500 pounds, instead of from zero load to breaking load has been proposed. It also has been proposed to include a table for correcting the results of the transverse test for variations in thickness of the bars.

The question whether it is desirable to include chemical requirements in specifications for cast iron was interestingly discussed, Robert Job, vice president; Milton Hersey Co., Ltd., Montreal, Canada, leading the argument for the affirmative in a preprinted paper, followed by an argument for the negative by Richard Moldenke, consulting engineer, Watchung, N. J.

Mr. Job, while admitting that, theoretically, physical tests could be made to determine the relative fitness of an iron casting for any given purpose, said that present knowledge as to physical tests often is insufficient to determine definitely the meaning of these tests in terms of actual serviceability of the casting under practical working conditions. Owing to this lack of knowledge, he maintained that supplementary chemical tests have been proved, by practical experience, necessary to secure efficient service from the castings.

Chilled iron car wheels were cited as an example of this and it is claimed that a wheel may meet all the physical tests required and still be

unfit for service on account of too high combined carbon, as indicated by wheels which have failed in service. Stem cylinders of a locomotive are used as an illustration where the iron is entirely different from that in chilled iron wheels. Here resistance to shock and abrasive action is said to be required, but no physical tests, it is claimed, have been developed by which the quality of the cylinder can be definitely determined, and it is the custom to hold the chemical composition within certain limits. Mr. Job maintains that for specifications the simplest arrangement of physical or chemical tests, or both, which will insure getting the properties proved by experience to be necessary to meet the conditions in service.

Dr. Moldenke advanced two general reasons for the introduction of chemical requirements into the usual specification for iron castings. The one was that wherever this has been tried in a general way it has failed in its purpose. The case was referred to one prominent engineering society which went into the subject and found that to include all the compositions of castings coming under each separate line of work, for which special specifications were to be prepared, would mean that the limits for the several elements in cast iron would have to be held so wide that no useful purpose would be served. The second reason given was that the history of the development in foundry practice has shown that present-day compositions of castings are considerably different from what was considered necessary some years back. Dr. Moldenke cites silicon as an example, and says that with more knowledge of the bad effects of dissolved iron oxide in cast iron, and definite information on the progression of cupola melting, the same grades of soft iron castings are now produced with much lower silicons than formerly. The general use of steel scrap in the mixtures was given as another instance requiring different compositions to produce the same physical effects as were obtained by straight iron mixtures.

Dr. Moldenke agreed that where it is known definitely that when a given maximum percentage of an element is exceeded, failure may result, it is wise to include this limit in the specification. However, Dr. Moldenke contended that the foundryman should not be burdened with a full line of chemical requirements in addition to physical tests.

An interesting discussion from the floor followed the presentation of the two sides presented and it developed that the opposing sides were not greatly in disagreement. It was generally agreed that certain types of castings such as car wheels require chemical limits in the specifications. However, a vote showed that the sentiment of the meeting was two to one in favor of omitting chemical requirements on all cast iron specifications except in special cases such as cited.

Progress reports also were made at this session by H. E. Smith, chairman of committee *A-2* on wrought iron; and by W. A. Selving, secretary, committee *D-5* on coal and coke. The latter committee submitted a proposed tentative method of test for volume of cell space of lump coke; also a proposed tentative specification for gas and coking coals. These were adopted as tentative.

A paper by G. St. J. Perrott and A. C. Fieldner on the properties of metallurgical coke was presented by Mr. Perrott. It described tests being conducted by the U. S. bureau of mines and discussed the relation between results of testing methods and the performance of coke in the blast furnace.

In line of standardization, W. A. Durgin, representing Secretary of Commerce Hoover, on Tuesday evening gave a popular talk with lantern slides covering data on overdiversification and illustrated how the adoption of simplified practice, the term applied by Mr. Hoover to standardization, has brought economies in many lines of industry, especially the paving brick and farm implement industries.

The cup and medal for the golf championship of the society was awarded to C. T. Ripley, Chicago, while for the lowest net score E. B. Curtis, New York, was given first prize; J. T. Rogers, Crum Lynne, Pa., second prize; and E. E. Hughes, Franklin, Pa., third prize. J. H. Chubb, Chicago, was winner of the "blind handicap" with W. M. Corse, Washington, taking second prize. Other prizes awarded went to M. M. Upson, New York; W. D. Kerlin, Camden, N. J.; D. W. Mulford, New York; L. W. Olson, Mansfield, O.; W. M. Kinney, Chicago; H. L. Sherman, Boston; J. S. Ervin, Pittsburgh; J. McE. Sanderson, Buffalo; J. P. Carswell, Hamilton, Ont., and W. K. Hatt, Washington. In the tennis tournament conducted at the same time, the cup for the championship was awarded to R. W. Seabury, Boonton, N. J.; while second prize went to L. P. Nemzek, Philadelphia.

Connecticut Electric Steel Casting Co., Springfield, Mass., and Hartford, Conn., has been incorporated with stock of $875,000, represented by 35,000 shares of $25 par, 7 per cent preferred and 4000 shares of no par common stock.

Ore Properties Income Shows a Decrease

Total income for the Great Northern Ore Properties for 1922 amounted to $4,465,035 compared with $6,088,063 in 1921, the report of the trustees shows. Total disbursements were $4,584,685.19, or $119,649.90 in excess of the total income for 1922. Total disbursements by the properties in 1921 were $4,960,872 and $7,226,204 in 1920. Excess of disbursements over receipts in 1921 was $873,837 and in 1920 it was $2,047,308, these figures comprising the net receipts for the periods mentioned.

The report states that leases covering the Carmi and Draper Annex mines, which were being negotiated at the close of 1921 between the Tyler Iron Mining Co. and the Mead Iron Co. and the Harrison Iron Mining Co., together with other fee owners and John A. Savage & Co., respectively, and referred to in the 1921 annual report, have not yet been executed but still are under consideration. Since the close of 1921 the Jackson Iron Mining Co., one of the proprietary companies embraced in the trust proper, sold its undivided sixteenth interest in the Itasca County, Minn., property known as the Lewis Mine, and the Aruthur Iron Mining Co. sold its lease on the property designated as the Niagara Mine, in St. Louis County, Minn., to the Braddock Iron Mining Co., of Duluth, Minn., a subsidiary of the United States Steel Corp.

The report lists among the disbursements for 1922 the sum of $3,000,000 paid on April 29 of that year to holders of its Beneficial Interest Certificates, or $2 per share, and $1,500,000 distributed to holders of these certificates on Dec. 21, 1922, or $1 per share. Undistributed receipts on Dec. 31, 1922 were $77,823.95 and compare with $197,473.85 on Dec. 31, 1921.

The consolidated balance sheet of Dec. 31, 1922, shows current cash assets held by the trustees and proprietary companies of $3,255,693.61 compared with $1,576,966 in 1921. Total current assets were $4,394,906.02 at the end of 1922 against $2,677,340 at the end of 1921. Current liabilities are listed as $640,388.68 for 1922 and in the balance sheet for 1921 were $358,560. Total liabilities were $59,910,924.02 for 1922 and $91.566,340 for 1921.

Wickwire Reports Profit

The Wickwire Spencer Steel Corp., Worcester, Mass., reports net profits for May, after all costs and expenses, of $230,061. Sales aggregated $2,679,463 while expenses and costs were $2,449,402. Profits for the five months ended May 31 were $1,321,500 and expenses for this period were $12,475,870.

Steel Exports Gain ; Imports Drop

Increase of 11,630 Tons Is Shown for May Exports Compared with Preceding Month but a Decline of 1954 Tons Is Registered for Imports —Pig Iron Imports Continue Heavy

WHILE exports of iron and steel during May showed a gain compared with the preceding month, figures just issued by the United States department of commerce, bureau of foreign and domestic commerce, for the month, show a decrease in imports of this material. Exports totaled 195,535 gross tons, a gain of 11,630 tons compared with April. May imports of iron and steel amounted to 75,840 gross tons or a decline of 1954 tons compared with the previous month.

In the five months ending with May, exports of iron and steel totaled 820,935 tons which is a decline of 142,697 tons compared with shipments abroad in the corresponding period of 1922. Imports in the first five months of 1923 totaled 436,867 gross tons. This is an increase of 356,165 tons compared with the same period of 1922.

During May gains were made in exports of pig iron, semifinished steel, iron bars, alloy steel bars, wire rods, boiler plate, black steel sheets, cold-rolled strip steel, plain structural shapes, ship and tank plates, metal lath, rails, rail joints, etc., railroad spikes, ralroad bolts, nuts, etc., boiler tubes, welded black pipe, welded galvanized pipe, cast iron pipe, cast iron pipe fittings, plain wire, galvanized wire, barbed wire, wire cloth and screening, wire rope, other wire, wire nails, horseshoe nails, horseshoes and ferrosilicon. Losses are reported for scrap, steel bars, other plates, galvanized sheets, black iron sheets, hoops, bands and scroll, tin and terne plate, fabricated structural shapes, other structural forms, switches, frogs, etc., casing and oil line pipe, malleable iron pipe fittings, woven wire fencing, insulated wire and cable, cut nails, other nails, bolts, nuts, rivets, etc., other forms of unclassified iron and steel and ferromanganese and spiegeleisen.

Exports of pig iron during the month totaled 1848 gross tons against 1844 tons in April. Of the tonnage shipped in May, Germany took 30, England 601, Canada 888, Mexico 162, Cuba 57, Argentina 75 and Colombia 35 gross tons. May rail exports totaled 30,847 gross tons. Of this amount Canada took 4985, Honduras 2061, Cuba 5325, Japan 13,653 and Awantung leased territory 1996 gross tons. Tin and terne plate exports in May totaled 13,328 gross tons. Principal exports of this material were 502 gross tons to Italy; 3769 to Canada; 864 to Argentina; 1862 to China; 4340 to Japan; 440 to Chile; 311 to Cuba and 318 to the Philippine Islands.

Shipments of galvanized iron and steel during the month amounted to 12,772 gross tons. Canada took 4439 gross tons; Cuba 1833; Argentina 1158; Japan 649; Colombia 449; Mexico 625, and Australia 635. Exports of black sheets were 12,137 tons, of which Canada took 5722 gross tons; Japan 5613; Argentina 113 and Cuba 127.

While total imports of iron and steel in May were below those of the preceding month individual gains were registered in some products. Increases were made in pig iron, ferromanganese, ferrosilicon, rails and splice bars, sheets and saw plates, wire rods, castings and forgings, nails and screws

IMPORTS AND EXPORTS
Gross Tons

	1923		1922	
	Imports	Exports	Imports	Exports
Jan.	119,955	135,046	13,404	165,962
Feb.	67,682	136,853	11,535	133,333
March	106,050	168,176	12,774	206,474
April	77,794	183,905	18,720	197,562
May	75,840	195,535	23,098	229,616
June	.....	.....	39,154	216,298
July	.....	.....	62,426	157,027
Aug.	.....	.....	49,054	144,264
Sept.	.....	.....	76,393	128,370
Oct.	.....	.....	184,202	131,542
Nov.	.....	.....	152,250	124,004
Dec.	.....	.....	96,358	154,087
Total	447,321	819,515	739,368	1,988,539

Year	Imports	Exports
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

IRON AND STEEL EXPORTS
Gross Tons

	May		Five months ending May	
	1923	1922	1923	1922
Pig iron	1,848	3,897	2,885	10,412
Scrap	3,809	12,817	16,856	56,133
*Semifin'd steel	12,270	13,090	53,227	54,279
Steel bars	14,280		69,487	
Iron bars	1,133	26,718	8,011	89,691
Alloy steel bars	216		636	
Wire rods	4,036	4,367	13,623	28,725
Boiler plate	578	2,173	3,899	8,887
Other plates	10,650	14,706	51,592	39,794
Galvanized sheets	12,772	9,487	56,839	53,438
Black sheets steel	12,137	34,619	45,939	145,718
Black sheets iron	1,421	584	5,387	5,919
Cold-rolled strips	1,849	274	6,163	1,767
Hoops, bands and scroll	2,435	2,263	11,744	12,091
Tin and terne plate	13,328	6,291	45,249	37,054
Struct'l shapes, plain	11,646	5,432	53,859	17,977
Struct'l shapes, fabricated	3,328	945	13,472	9,233
Ship and tank plates, punched and shaped	367	137	1,102	1,081
Other structural forms	2,740	12,673	14,896	30,851
Metal lath	190	**	450	**
Rails over 50 pounds	26,459	20,152	92,903	99,019
Rails under 50 pounds	4,388	3,660	12,594	12,253
Rails, joints, etc.	3,959	1,861	9,043	7,251
Switches, frogs, etc.	255	331	1,939	2,238
Railroad spikes	848	663	3,261	2,817
Railroad bolts, nuts, etc.	200	154	946	815
Boiler tubes	1,232	754	6,143	4,008
Casing and oil line pipe	5,489	4,976	22,719	19,483
Welded black pipe	8,922	6,917	30,644	35,749
Welded galvanized pipe	2,019	2,937	10,576	11,661
Malleable iron pipe fittings	632	778	2,918	3,402
Cast iron pipe	1,698	1,188	6,403	7,096
Cast iron pipe fittings	1,333	742	4,995	3,472
Plain wire	5,137	3,199	14,232	4,409
Galvanized wire	8,677	9,636	24,989	42,399
Barbed wire	8,568	7,547	31,186	22,123
Woven wire fencing	348	243	1,591	990
Wire cloth and screening	109	143	550	454
Wire rope	598	343	2,708	1,650
Insulated wire and cable	55	47	703	429
Other wire	1,350	1,151	5,956	6,674
Cut nails	201	292	1,441	1,631
Wire nails	4,788	5,797	14,565	34,604
Horseshoe nails	115	58	529	338
Other nails	432	459	2,064	1,830
‡Bolts, nuts, rivets, etc.	1,748	1,636	8,453	7,839
Horseshoes	61	108	294	290
Other iron and steel	5,290	4,201	27,768	24,788
Ferromanganese				
and spiegeleisen	503	41	3,060	679
Ferrosilicon	94	42	446	191
Total	195,535	230,529	820,935	963,632

*Includes ingots, blooms, billets, slabs and skelp.
**Due to reclassification comparisons are not possible.
‡Includes wood screws.

CASTINGS AND FORGINGS EXPORTS
Gross Tons

	May		Five months ending May	
	1923	1922	1923	1922
Iron castings	506	971	4,099	4,504
Steel castings	947	194	1,808	988
Car wheels and axles	1,835	685	6,817	6,493
Iron and steel forgings	248	198	1,409	1,042
Total	3,536	2,048	14,133	13,027

FERROALLOY EXPORTS
Gross Tons

	May		Five months ending May	
	1923	1922	1923	1922
Ferrosilicon	94	42	446	191
Ferromanganese and spiegeleisen	503	41	3,060	679
Tungsten, manganese and other ores	129	.....	369	.....
Ferrotungsten, tungsten metal and wire	1	1	842	15
Ferrovanadium	3	2	12	17
Other ferroalloys	1	2	378	473

and bolts, nuts and rivets. Losses were reported for scrap iron and steel, bar iron, steel ingots, bars, etc., structural shapes, boiler and other plates, tin plate, tubular products, round iron and steel wire and flat wire and strip steel. Pig iron continues to be the heaviest item. In May these imports amounted to 39,764 gross tons which compares with 36,271 tons in April and 4476 in May, 1923. In the five months ending May, 258,107 gross tons has been imported

PIG IRON IMPORTS

Gross Tons

From:	May, 1923
Belgium	1,525
France	132
Germany	2,000
Sweden	79
England	25,116
Canada	7,787
British India	3,025
China	100
Total	39,764

IRON ORE IMPORTS

Gross Tons

From:	May 1923	May 1922	Five months ending May 1923	Five months ending May 1922
Spain	64,676	5,822	105,725	15,979
Sweden	138,642	12,590	323,410	20,048
Canada	2,059	95	2,438	607
Cuba	55,712	11,200	267,851	32,250
Other countries	102,703	.....	351,687	4,996
Total	363,792	29,707	1,051,111	73,880

against 20,549 tons in first five months of 1922. Of the total imports of pig iron in May, England was the heaviest contributor, 25,116 gross tons coming from that country. Other countries from which pig iron was imported were Belgium 1525 tons; France 132; Germany 2000; Sweden 79; Canada 7787; British India 325 and China 100.

During the month 363,792 gross tons of iron ore was imported which compares with 171,459 tons in April and 29,707 tons in May, 1922. In

IRON AND STEEL IMPORTS

Gross Tons

	May 1923	May 1922	Five months ending May 1923	Five months ending May 1922
Pig iron	39,764	4,476	258,107	20,549
Ferromanganese	8,651	5,218	34,745	13,758
Ferrosilicon	1,831	588	6,346	3,258
Scrap iron and steel	18,390	7,228	96,829	19,167
Bar iron	826	49	2,938	1,132
Steel ingots, bars, etc.	699	2,056	7,210	9,285
Struct'l shapes	737	237	3,261	953
Rails and splice bars	2,945	2,962	10,278	9,772
Boiler and other plates	2	33	366	143
Sheets and saw plates	139		150	
Tin plate	543	83	9,254	2,016
Wire rods	30	101	1,485	669
Total	74,557	23,031	430,969	80,702

OTHER IMPORTS

Gross Tons

Tubular products	439	*	2,120	*
Round iron and steel wire	230	*	1,685	*
Castings and forgings	357	*	1,025	*
Nails and screws	127	*	506	*
Bolts, nuts, rivets, etc.	42	*	113	*
Flat wire and strip steel	88	*	449	*
Grand total	75,840		436,867	

*Due to changes in classifications comparisons are not possible.

the five months ending with May, 1,051,000 gross tons of this material has been imported compared with 73,880 gross tons in the corresponding period of 1922. Sweden was the heaviest contributor of iron ore in May, 138,642 gross tons coming from that country.

A total of 12,734 gross tons of manganese ore was imported in May. Of this amount 22 tons came from Germany; 924 from Turkey in Europe; 6285 from Brazil; 750 from British India; 3211 from British West Africa and 1543 tons from Cuba. During the month 8651 gross tons of ferromanganese was brought in from England.

Valuation of iron and steel imports in May was $2,900,561 which compares with $3,129,185 in April and $1,880,601 in May, 1922. Exports during May were valued at $22,720,335. This compares with $20,146,346 in April and $17,744,193 in May, 1922.

Eastern Zinc Output Gains

Washington, July 3.—Zinc ore mined and recovered in the eastern states in 1922 showed an increase of approximately 30 per cent, according to figures recently issued by the United States geological survey. The total zinc ore mined and treated in 1922 in the United States amounted to 989,901 tons, of which 512,290 tons was from New Jersey and 53,400 tons was from New York. Most all of the zinc ore from Tennessee and New York was sent to concentrating plants and 450,187 tons of the zinc ore from New Jersey was concentrated and the remainder shipped as crude ore.

FERROMANGANESE AND MANGANESE ORE IMPORTS

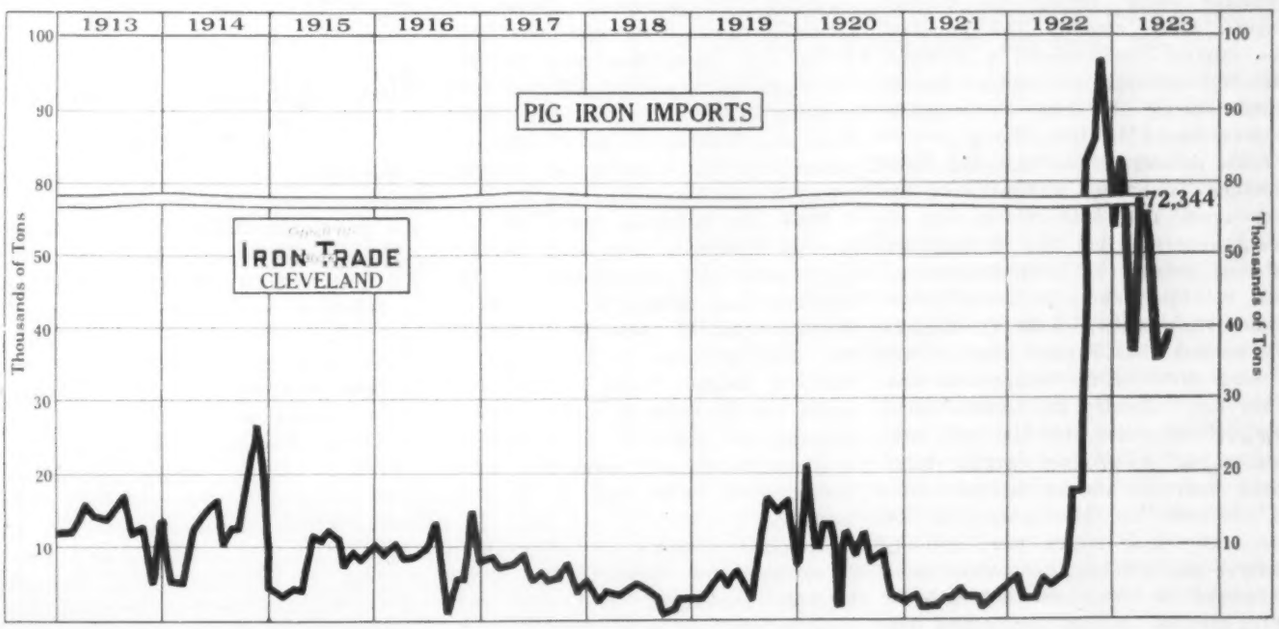
Gross Tons

Manganese ore from:	May, 1923
Germany	22
Turkey-in-Europe	923
Brazil	6,285
British India	750
British West Africa	3,211
Cuba	1,543
Total	12,734
Ferromanganese from:	
England	8,651

IMPORTS OF VARIOUS ORES AND FERROALLOYS

Gross Tons

	May 1923	May 1922	Five months ending May 1923	Five months ending May 1922
Ferromanganese	8,651	5,218	34,745	13,758
Ferrosilicon	1,831	588	6,346	3,258
Manganese ore	12,734	46,517	45,069	103,900
Tungsten bearing ore	.....	.....	.....	.....
Nickel ore	473	.....	2,186	.....



Better Outlook

In Coke By-Products After Recent Weakening of Oil Distillate

New York, July 3.—While prices on light oil distillates, particularly benzol, are subject to shading the market now appears firmer. The two leading sellers are understood to have only a limited amount of nearby material for disposal, and while some of the smaller interests are not in such good position, the outlook for new business is more encouraging. The dye industry which has been buying spasmodically for the past few weeks, is showing more interest and the paint manufacturers are buying in better volume. The rubber industry is doing better.

Coke Oven By-Products

Spot*

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.28
Naphthalene flake	0.9 ½
Naphthalene balls	0.10½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.10 to $3.15

Contract

Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.28
Naphthalene flake	0.9 ½
Naphthalene balls	0.10½

*Spot distillate prices are subject to shading.

A fairly good demand is noted from abroad, France, England and Germany being among the foreign buyers. Only recently has at least one interest been offered a 2500-ton monthly contract to supply benzol, which, owing to lack of supplies, it was forced to turn down.

Some interests state that the Ruhr situation is having a depressing effect upon the domestic market, it being reported that the French are offering substantial accumulations of coal tar by-products in neutral markets. Other sellers, however, express the opinion that French offerings are a minor factor in the recent weakness. They say, following the termination of the coal and rail strikes last year, production at by-product works made rapid recoveries and by the latter part of the year had almost reached 100 per cent. Back orders were speedily covered and a substantial accumulation developed in the following two or three months. Sellers sought new outlets and were coming out of the situation in a fairly satisfactory manner, when a heavy volume of gasoline from the Califronia crude oils was placed upon the market. This gasoline was of such a good grade as to interfere materially with the sale of motor fuel. In a short time it virtually broke the gasoline market which in turn had a weakening influence on motor benzol. This gasoline afforded some competition in the industrial as well as the automotive field. A surplus of industrial distillates as well as motor fuel developed, although this was due principally to the backing up of demand and buying of motor fuel.

Certain foreign countries ordinarily substantial buyers here, noted the weakening in the market and held off buying. It has only been within a relatively short time that these interests have been coming back into the market.

Two of the leading sellers upon accumulation of this second surplus, it is understood, were again able to develop means of getting rid of much of their extra stocks. Some of the smaller factors, however, found it more difficult to do so, and it has been these offerings that have contributed to the somewhat unsettled conditions. Scattered offerings of resale lots also have appeared. Consumers and jobbers late last year, anticipating a still higher market this year, bought substantial quantities, more or iess on speculation. Because of the unexpected weakness in prices, many have been offering their supplies at concessions.

Another and important depressing factor has been the unusually high rate of operations, which generally has exceeded all expectations. Production in some cases, it is said, has been 50 per cent higher than what was believed to be a normal 100 per cent capacity. Only recently has there been any slowing up at all, due apparently to the severely hot weather which has been experienced.

While the following prices are subject to shading in some quarters they are substantially representative of the market: Pure benzol, 27 cents works in tanks and 32 cents in drums; 90 per cent, 25 cents in tanks and 30 cents in drums; toluol, 30 cents in tanks and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; and commercial xylol, 29 cents in tanks and 34 cents in drums.

Although sulphate of ammonia is in rather slow demand, the market remains unchanged. Ball and flake naphthalene also is unchanged.

Wage Increase Demanded by Anthracite Miners

Scranton, Pa., July. 3.—A demand for a 20 per cent wage increase will be presented by the anthracite mine workers to the coal operators in the coming negotiations for a new wage contract as a result of the convention of miners here last Friday. The principal demands decided on call for an increase of 20 per cent in the contract wage; $2 a day increase for men paid by the day; a two-year contract with full recognition of the union; uniformity and equalization of all day rates; the eight-hour day for all men employed in and about the mines; that where coal is paid for by the car the system be changed and it be paid for by weight, and a number of other demands of a technical nature. They follow, generally, those adopted at the convention in Shamokin, Pa., in January, 1922, and for which the miners fought for five and a half months, the men finally returning to work without an increase in wages, but maintaining the scale under which they had quit.

The present agreement, which was entered into last September, expires Aug. 31, and it was announced the new demands will be presented to the operators as soon after July 4 as possible. The convention took no action on a question of suspension in event the negotiations run beyond Aug. 31.

Two radicals, who were accused of being back of a plot of the Communist party in the United States to set up a dual organization in the coal fields to wreck the mine workers' union, were ejected from the convention hall, after John L. Lewis, international president of the United Mine Workers, ordered them to "remove their carcasses."

Ship Tonnage on Ways Show Loss

Washington, July 3.—American shipyards on June 1 had only 104 steel vessels aggregating 150,433 gross tons under construction or contract, compared with 250 steel vessels of 240,745 tons on May 1, according to the bureau of navigation of the department of commerce. These figures do not include any government shipping. Leading tonnages under contract or construction on June 1 were: American Shipbuilding Co., Cleveland, 42,984; various Bethlehem Shipbuilding Corp. yards, 26,854; New York Shipbuilding Corp., Camden, N. J., 16,715; and the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and Toledo Shipbuilding Co., Toledo, O., each 13,000.

1922 Steel Output Gains Heavily

Ingots and Castings, with a Total of 35,602,926 Gross Tons, Show Improvement of 80 Per Cent Over 1921

COMPARED with a steel production in 1921 which was the lowest in 14 years or since 1908, the output for 1922 registered a gain of 80 per cent, and reached a total which was 79 per cent of the high point record of 1917, according to the annual statistics compiled by the American Iron and Steel institute. Finished rolled iron and steel products made in 1922 showed an improvement of about the same proportion. With the exception of structural shapes, merchant bars, concrete bars, seamless steel tubes, and miscellaneous products, which made gains of over 100 per cent, practically all products showed a fairly uniform rate of gain.

Steel ingots and castings totaled 35,602,926 gross tons, which compared with 19,783,797 tons was an increase of 15,819,129 tons. Compared with the high record total of 45,060,607 tons in 1917, the 1922 total is lower by 9,457,681 tons. Steel ingots made in 1922 totaled 34,568,418 tons and was an improvement of 15,344,334 tons over the 19,224,084 tons of the previous year. In 1922, 157 works in 24 states and the District of Columbia made steel ingots, against 160 works in 24 states and the District of Columbia in 1921. Of the grand total of 35,602,926 tons of steel ingots and castings made in 1922, steel castings contributed 1,034,508 tons. In 1921 the castings total was 559,713 tons out of 19,783,797 tons. In 1922, 289 works engaged in the manufacture of steel castings as compared with 290 the preceding year.

Included in the 28,387,171 tons of basic open-hearth steel ingots and castings produced in 1922 were 1,651,089 tons of duplex steel ingots and castings which were made from metal partly purified in bessemer converters and finally purified in basic open-hearth furnaces, against 840,251 tons in 1921, an increase of 810,838 tons, or 96.5 per cent. In 1920 the production of duplex steel was 3,279,119 tons and in 1919, it was 2,819,785 tons. Production of alloy steel in 1922 was 1,673,496 tons, as compared with 809,548 tons the year before. Of this amount 1,614,392 tons was ingots and 59,104 tons was castings. Electric steel made in 1922 was 346,039 tons, as against 169,499 tons during 1921.

Finished rolled iron and steel in 1922 aggregated 26,452,004 gross tons, an output which was 11,677,998 tons better than the 14,774,006-ton total of 1921, with 79.04 per cent gain.

Merchant bars gained from 1,565,754 tons in 1921 to 3,978,658 tons in 1922; structural shapes from 1,272,624 tons to 2,718,768 tons; plates and sheets from 4,260,574 tons to 7,968,397 tons; wire rods from 1,564,330 tons to 2,654,741 tons; iron and steel pipe from 1,987,442 tons to 2,732,236 tons; concrete reinforcing bars from 227,228 tons to 575,816 tons; tin and terne plate from 1,779,174,813 pounds to 2,884,382,227 pounds; wire nails from 11,259,762 100-pound kegs to 13,820,863 kegs; hoops from 166,961 tons to 222,139 tons; bands and cotton ties from 111,426 tons to 271,101 tons; seamless tubes from 117,884 tons to 257,835 tons; rail joints and track fastenings from 394,673 tons to 537,639 tons. Cast iron pipe production in 1922 was 1,283,449 tons, compared with 794,230 tons in 1921. Iron and steel rails decreased from 2,178,818 tons to 2,171,776 tons.

Of the total production of finished material in 1922, about 96.6 per cent was rolled from steel against 96.3 per cent in 1921.

PRODUCTION OF STEEL INGOTS AND CASTINGS BY PROCESSES.

Years	Open-hearth. Basic.	Open-hearth. Acid.	Open-hearth. Total.	Bessemer.	Crucible.	Electric.	Miscellaneous	Total. Gross tons.
1908.	7,140,425	696,304	7,836,729	6,116,755	63,631	.....	6,132	14,023,247
1909.	13,417,472	1,076,464	14,493,936	9,330,783	107,355	13,762	9,185	23,955,021
1910.	15,292,329	1,212,180	16,504,509	9,412,772	122,303	52,141	3,194	26,094,919
1911.	14,685,932	912,718	15,598,650	7,947,854	97,653	29,105	2,844	23,676,106
1912.	19,641,502	1,139,221	20,780,723	10,327,901	121,517	18,309	2,853	31,251,303
1913.	20,344,626	1,255,305	21,599,931	9,545,706	121,226	30,180	3,831	31,300,874
1914.	16,271,129	903,555	17,174,684	6,220,846	89,869	24,009	3,622	23,513,030
1915.	22,308,725	1,370,377	23,679,102	8,287,213	113,782	69,412	1,527	32,151,036
1916.	29,616,658	1,798,769	31,415,427	11,059,039	129,692	168,918	604	42,773,680
1917.	32,087,507	2,061,386	34,148,893	10,479,960	126,716	304,543	495	45,060,607
1918.	32,476,571	1,982,820	34,459,391	9,376,236	115,112	511,364	329	44,462,432
1919.	25,719,312	1,229,382	26,948,694	7,271,562	63,572	384,432	2,952	34,671,232
1920.	31,375,723	1,296,172	32,671,895	8,883,087	72,265	502,152	3,535	42,132,934
1921.	15,082,564	507,238	15,589,802	4,015,938	7,613	169,499	945	19,783,797
1922.	28,387,171	921,812	29,308,983	5,919,298	28,606	346,039	.....	35,602,926

PRODUCTION OF STEEL CASTINGS.

1908.	155,005	156,772	311,777	20,559	8,271	.....	5,613	346,220
1909.	306,005	295,035	601,040	33,814	12,683	306	8,399	656,242
1910.	433,976	429,375	863,351	58,335	14,632	1,320	3,194	940,832
1911.	266,626	304,565	571,191	57,101	14,030	1,878	2,427	646,627
1912.	443,998	426,850	870,848	68,750	20,550	4,162	2,311	966,621
1913.	460,161	450,055	910,216	80,506	17,571	9,207	3,244	1,020,744
1914.	334,144	270,173	604,317	65,882	11,186	8,551	3,310	693,246
1915.	333,103	402,229	735,332	92,476	14,756	23,064	1,196	866,824
1916.	605,512	570,937	1,176,449	142,791	9,351	42,870	302	1,371,763
1917.	558,568	654,588	1,213,156	159,272	3,834	64,911	234	1,441,407
1918.	505,880	634,950	1,140,830	160,844	1,330	108,296	110	1,411,410
1919.	313,965	448,555	762,520	98,819	1,009	111,510	2,579	976,437
1920.	449,330	537,070	986,400	104,986	1,729	155,196	3,237	1,251,542
1921.	217,957	216,488	434,445	38,809	736	85,095	628	559,713
1922.	425,981	404,767	830,748	47,733	1,045	154,982	.....	1,034,508

PRODUCTION OF ALLOY STEEL INGOTS AND CASTINGS.

Years.	Ingots.	Castings.	Total.	Years.	Ingots.	Castings.	Total.
1909....	158,978	23,002	181,980	1916...	1,306,157	56,458	1,362,615
1910....	538,462	29,357	567,819	1917...	1,576,806	67,529	1,644,335
1911....	425,169	56,290	481,459	1918...	1,721,367	66,485	1,787,852
1912....	689,392	103,109	792,501	1919...	1,435,816	45,372	1,481,188
1913....	625,430	88,927	714,357	1920...	1,591,939	68,353	1,660,292
1914....	577,107	69,846	646,953	1921...	769,293	40,255	809,548
1915....	923,251	97,896	1,021,147	1922...	1,614,392	59,104	1,673,496

PRODUCTION OF ALLOY STEEL INGOTS AND CASTINGS, BY PROCESSES, GROSS TONS, 1922.

Processes.	Ingots.	Castings.	Total.
Open-hearth steel—basic	1,341,807	1,792	1,343,599
Open-hearth steel—acid	66,285	26,438	92,723
Bessemer steel	89,234	13,064	102,298
Crucible steel	9,407	50	9,457
Electric and miscellaneous steel	107,659	17,760	125,419
Total ..... Gross tons	1,614,392	59,104	1,673,496

TOTAL PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL, 1887–1922.

Years.	Iron and steel rails.	Plates and sheets.	Nail plate.	Wire rods.	Structural shapes.	All other finished rolled.	Total. Gross tons.
1887.	2,139,640	603,355	308,432	.....	.....	2,184,279	5,235,706
1888.	1,403,700	609,827	289,891	279,769	.....	2,034,162	4,617,349
1889.	1,522,204	716,496	259,409	363,851	.....	2,374,968	5,236,928
1890.	1,885,307	809,981	251,828	457,099	.....	2,618,660	6,022,875
1891.	1,307,176	678,927	223,312	536,607	.....	2,644,941	5,390,963
1892.	1,551,844	751,460	201,242	627,829	453,957	2,579,482	6,165,814
1893.	1,136,458	674,345	136,113	537,272	387,307	2,104,190	4,975,685
1894.	1,021,772	682,900	108,262	673,402	360,305	1,795,570	4,642,211
1895.	1,306,135	991,459	95,085	791,130	517,920	2,487,845	6,189,574
1896.	1,122,010	965,776	72,137	623,986	495,571	2,236,361	5,515,841
1897.	1,647,892	1,207,286	94,054	970,736	583,790	2,497,970	7,001,728
1898.	1,981,241	1,448,301	70,188	1,071,683	702,197	3,239,760	8,513,370
1899.	2,272,700	1,903,505	85,015	1,036,398	850,376	4,146,425	10,294,419
1900.	2,385,682	1,794,528	70,245	846,291	815,161	3,575,538	9,487,443
1901.	2,874,639	2,254,425	68,850	1,365,934	1,013,150	4,772,329	12,349,327
1902.	2,947,933	2,665,409	72,936	1,574,293	1,300,326	5,383,219	13,944,116
1903.	2,992,477	2,599,665	64,102	1,503,455	1,095,813	4,952,185	13,207,697
1904.	2,284,711	2,421,398	61,601	1,699,028	949,146	4,597,497	12,013,381
1905.	3,375,929	3,532,230	64,542	1,808,688	1,660,519	6,398,107	16,840,015
1906.	3,977,887	4,182,156	54,211	1,871,614	2,118,772	7,383,828	19,588,468
1907.	3,633,654	4,248,832	52,027	2,017,583	1,940,352	7,972,374	19,864,822
1908.	1,921,015	2,649,693	45,747	1,816,949	1,083,181	4,311,608	11,828,193
1909.	3,023,845	4,234,346	63,746	2,335,685	2,275,562	7,711,506	19,644,690
1910.	3,636,031	4,955,484	45,294	2,241,830	2,266,890	8,475,750	21,621,279
1911.	2,822,790	4,488,049	48,522	2,450,453	1,912,367	7,316,990	19,039,171
1912.	3,327,915	5,875,080	45,331	2,653,553	2,846,487	9,908,475	24,656,841
1913.	3,502,780	5,751,037	37,503	2,464,807	3,004,972	10,030,144	24,791,243
1914.	1,945,095	4,719,246	38,573	2,431,744	2,031,124	7,204,444	18,370,196
1915.	2,204,203	6,077,694	31,929	3,095,907	2,437,003	10,546,188	24,392,924
1916.	2,854,518	7,453,980	30,088	3,518,746	3,029,964	15,493,093	32,380,389
1917.	2,944,161	8,267,616	22,864	3,137,138	3,110,000	15,585,921	33,067,700
1918.	2,540,892	8,799,135	18,310	2,562,390	2,849,969	14,385,058	31,155,754
1919.	2,203,843	7,372,814	12,832	2,538,476	2,614,036	10,359,543	25,101,544
1920.	2,604,116	9,337,680	20,577	3,136,907	3,306,748	13,941,835	32,347,863
1921.	2,178,818	4,260,574	14,573	1,564,330	1,272,624	5,483,087	14,774,006
1922.	2,171,776	7,968,397	21,969	2,654,741	2,718,768	10,916,353	26,452,004

Finished Products Also Increase

PRODUCTION OF CONCRETE BARS, SHOWING IRON AND STEEL CONCRETE BARS SEPARATELY, GROSS TONS, 1909–1922.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1909	.....	159,352	159,352	1916	2,683	458,717	461,400
1910	4,645	236,464	241,109	1917	1,497	469,687	471,184
1911	2,388	256,353	258,741	1918	468	344,152	344,620
1912	2,500	271,832	274,332	1919	2,295	416,726	419,021
1913	113	319,557	319,670	1920	698	571,747	572,445
1914	.....	288,471	288,471	1921	1,094	226,134	227,228
1915	.....	353,408	353,408	1922	696	575,120	575,816

PRODUCTION OF WIRE RODS, GROSS TONS, 1891–1922.

Years.	Tons.	Years.	Tons.	Years.	Tons.	Years.	Tons.
1891	536,607	1899	1,036,398	1907	2,017,583	1915	3,095,907
1892	627,829	1900	846,291	1908	1,816,949	1916	3,518,746
1893	537,272	1901	1,365,934	1909	2,335,685	1917	3,137,138
1894	673,402	1902	1,574,293	1910	2,241,830	1918	2,562,390
1895	791,130	1903	1,503,455	1911	2,450,453	1919	2,538,476
1896	623,986	1904	1,099,028	1912	2,653,553	1920	3,136,907
1897	970,736	1905	1,808,688	1913	2,464,807	1921	1,564,330
1898	1,071,683	1906	1,871,614	1914	2,431,714	1922	2,654,741

PRODUCTION OF MERCHANT BARS, SHOWING IRON AND STEEL MERCHANT BARS SEPARATELY, GROSS TONS, 1905–1922.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1905	1,322,439	2,271,162	3,593,601	1914	563,171	1,960,460	2,523,631
1906	1,481,348	2,510,852	3,992,200	1915	657,107	3,474,135	4,131,242
1907	1,440,356	2,530,632	3,970,988	1916	993,948	5,236,354	6,230,302
1908	685,233	1,301,405	1,986,638	1917	983,926	5,226,031	6,209,957
1909	952,230	2,311,301	3,263,531	1918	846,898	5,395,851	6,242,749
1910	1,074,163	2,711,568	3,785,731	1919	446,549	3,945,075	4,391,624
1911	835,625	2,211,737	3,047,362	1920	663,032	5,467,208	6,130,240
1912	944,790	2,752,324	3,697,114	1921	198,324	1,367,430	1,565,754
1913	1,026,632	2,930,977	3,957,609	1922	317,665	3,660,993	3,978,658

PRODUCTION OF SKELP, SHOWING IRON AND STEEL SKELP SEPARATELY, GROSS TONS, 1905–1922.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1905	452,797	983,198	1,435,995	1914	264,340	1,718,091	1,982,431
1906	391,517	1,137,068	1,528,585	1915	202,198	2,037,266	2,299,464
1907	444,536	1,358,091	1,802,627	1916	355,445	2,572,229	2,927,674
1908	297,049	853,534	1,150,583	1917	336,591	2,337,640	2,674,231
1909	370,151	1,663,230	2,033,381	1918	258,500	2,305,511	2,564,011
1910	350,578	1,477,616	1,828,194	1919	192,146	2,363,632	2,555,778
1911	322,397	1,658,276	1,980,673	1920	252,403	2,967,886	3,220,289
1912	327,012	2,119,804	2,446,816	1921	115,523	1,815,052	1,930,575
1913	312,746	2,189,218	2,501,964	1922	218,868	2,640,227	2,859,095

PRODUCTION OF SEAMLESS STEEL TUBES, GROSS TONS, 1913–1922.

Years.	Hot finished.	Cold drawn.	Total.	Years.	Hot finished.	Cold drawn.	Total.
1913	42,740	65,827	108,567	1918	142,308	150,586	292,894
1914	36,939	53,656	90,595	1919	75,864	121,505	197,369
1915	63,488	76,180	139,668	1920	132,091	159,479	291,570
1916	61,235	129,238	190,473	1921	59,663	58,221	117,884
1917	87,615	139,060	226,675	1922	120,652	137,183	257,835

PRODUCTION OF TINPLATES AND TERNE PLATES, 1891–1922.

Years.	Tinplates.	Terne plates.	Total pounds.
1891 (second 6 months)	368,400	1,868,343	2,236,743
1892 (calendar year)	13,921,296	28,197,896	42,119,192
1893	64,536,209	59,070,498	123,606,707
1894	102,223,407	64,120,002	166,343,409
1895	165,927,907	88,683,488	254,611,395
1896	270,151,785	89,058,013	359,209,798
1897 (first 6 months)	203,028,258	49,545,643	252,573,901
1897 (second 6 months)	.....	.....	322,205,619
1898 (calendar year)	.....	.....	732,289,600
1899	.....	.....	808,360,000
1900 (cen. year end. May 31)	707,718,239	141,285,783	*850,004,495
1901 (calendar year)	.....	.....	894,411,840
1902	.....	.....	806,400,000
1903	.....	.....	1,075,200,000
1904 (cen. year end. Dec. 31)	867,526,985	158,857,866	*1,032,940,706
1905 (calendar year)	.....	.....	1,105,440,000
1906	1,100,373,000	193,367,000	1,293,740,000
1907	996,650,000	156,447,000	1,153,097,000
1908	1,048,896,000	154,179,000	1,203,075,000
1909	1,179,858,000	190,930,000	1,370,788,000
1910	1,450,821,000	168,184,000	1,619,005,000
1911	1,597,629,000	158,441,000	1,756,070,000
1912	1,965,659,000	191,396,000	2,157,055,000
1913	1,708,186,000	136,944,000	1,845,130,000
1914	1,939,785,000	146,195,000	2,085,980,000
1915	2,201,825,054	163,470,646	2,365,295,700
1916	2,552,224,275	214,176,952	2,766,401,227
1917	3,233,314,911	153,891,653	3,387,206,564
1918	3,216,247,675	85,376,569	3,301,624,244
1919	2,407,156,757	†171,859,924	†2,579,016,681
1920	3,079,953,351	†158,067,437	†3,238,020,788
1921	1,675,320,852	†103,853,961	†1,779,174,813
1922	2,707,648,743	176,733,512	2,884,382,227

* Includes 1,030,473 pounds in 1900 and 6,555,855 pounds in 1904 of "other sheet iron and sheet steel, tin or terne plated."
† Revised.

PRODUCTION OF CAST-IRON PIPE AND FITTINGS, NET TONS.

Years.	Gas and water.*	Soil and plumbers.	Total.	Years.	Gas and water.*	Soil and plumbers.	Total.
1913	1,010,016	256,229	1,266,245	1918	508,300	111,373	619,673
1914	938,297	222,483	1,160,780	1919	514,664	195,417	710,081
1915	956,372	258,498	1,214,870	1920	636,862	249,653	886,515
1916	934,626	279,707	1,214,333	1921	564,138	230,092	794,230
1917	748,173	250,928	999,101	1922	926,577	356,872	1,283,449

*Includes culvert pipe. Manufacturers able to separate their production report 17,645 tons of culvert pipe and fittings in 1922 and 11,317 tons in 1921.

PRODUCTION OF STRUCTURAL SHAPES, GROSS TONS, 1902–1922.

Years.	Tons.	Years.	Tons.	Years.	Tons.
1902	1,300,326	1909	2,275,562	1916	3,029,964
1903	1,095,813	1910	2,266,890	1917	3,110,000
1904	949,146	1911	1,912,367	1918	2,849,969
1905	1,660,519	1912	2,846,487	1919	2,614,036
1906	2,118,772	1913	3,004,972	1920	3,306,748
1907	1,940,352	1914	2,031,124	1921	1,272,624
1908	1,083,181	1915	2,437,003	1922	2,718,768

PRODUCTION OF PLATES AND SHEETS BY KINDS, 1921–1922.

Kinds.	1921—Gross tons.			1922—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Universal plates*	1,498	589,112	570,610	3,270	1,245,143	1,248,413
Sheared plates—						
Rolled on single stands	89	985,273	985,362	169	1,711,743	1,711,912
Roughed and fin. on sep. stands	.....	204,352	204,352	.....	459,595	459,595
Black sheets rolled on sheet or jobbing mills	18,650	1,493,167	1,511,817	37,406	2,879,830	2,917,236
Black plates, including black plates for tinning and black plate specialties rolled on tin mills	.....	988,433	988,433	.....	1,631,241	1,631,241
Total	20,237	4,240,337	4,260,574	40,845	7,927,352	7,968,397

*Include flats and bars over 6 inches wide.

PRODUCTION OF WROUGHT PIPE AND BOILER TUBES, SHOWING IRON AND STEEL SEPARATELY, 1921–1922.

Kinds of pipe.	1921—Gross tons.			1922—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Black, standard	45,337	685,459	730,796	87,154	973,906	1,061,060
Galvanized	20,937	246,122	267,059	30,852	359,288	390,140
Oil country goods	29,026	862,969	891,995	33,223	1,106,611	1,139,834
O. D. and misc.	104	40,355	40,459	62	66,713	66,775
Boiler tubes	14,889	42,244	57,133	19,944	54,483	74,427
Total	110,293	1,877,149	1,987,442	171,235	2,561,001	2,732,236

PRODUCTION OF MISCELLANEOUS ROLLED PRODUCTS, GROSS TONS, 1918–1922.

Products.	1918.	1919.	1920.	1921.	1922.
Hoops	262,281	233,336	333,440	166,961	222,139
Bands and cotton-ties	250,767	352,172	388,862	111,426	271,101
Long angle splice bars, fish-plate bars, tie-plate bars, etc	416,905	434,008	575,830	423,820	605,688
Rolled sheet piling	11,689	17,811	20,716	18,165	13,220
Railroad ties	6,438	16,645	26,310	10,361	14,811
Rolled forging blooms, forging billets, etc	*1,659,118	*359,582	*447,334	*108,456	*326,303
Blooms, billets, sheet bars, tinplate bars, etc., for export	832,746	92,143	136,457	7,506	11,299
Spike and chain rods, bolt and nut rods, horseshoe bars, strips, shafting, tires, etc	1,793,734	1,487,423	2,089,912	912,835	2,038,223
Total	5,233,678	2,993,120	4,018,861	1,759,530	3,502,784

*Exports included.

PRODUCTION OF WIRE NAILS IN 100-LB. KEGS, 1891–1922.

Years.	Production.	Exports.	Consumption.	Years.	Production.	Exports.	Consumption.
1891	4,114,383	18,986	4,095,399	1907	11,731,044	945,035	10,786,009
1892	4,719,524	21,387	4,698,137	1908	10,662,972	593,819	10,069,153
1893	5,095,945	27,451	5,068,494	1909	13,916,053	686,687	13,229,366
1894	5,681,801	38,920	5,642,881	1910	12,704,902	960,295	11,744,607
1895	5,841,403	53,012	5,788,391	1911	13,437,778	1,200,957	12,236,821
1896	4,719,860	95,638	4,624,222	1912	14,659,700	1,530,353	13,129,347
1897	8,997,245	129,767	8,867,478	1913	13,559,727	977,477	12,582,250
1898	7,418,475	307,190	7,111,285	1914	13,132,814	809,167	12,323,647
1899	7,618,130	750,781	6,867,349	1915	14,583,026	2,051,475	12,531,551
1900	7,233,979	613,858	6,620,121	1916	17,147,665	3,363,876	13,783,789
1901	9,803,822	420,506	9,383,316	1917	17,040,666	2,574,054	14,466,612
1902	10,982,246	595,391	10,386,855	1918	12,279,800	1,763,460	10,516,340
1903	9,631,661	704,546	8,927,115	1919	13,094,221	2,011,045	11,083,176
1904	11,926,661	734,554	11,192,107	1920	16,449,506	2,087,195	14,362,311
1905	10,854,892	799,734	10,055,158	1921	11,889,412	629,650	11,259,762
1906	11,486,647	1,035,705	10,450,942	1922	15,053,330	1,232,467	13,820,863

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

ERNEST G. JARVIS, recently elected vice president and general manager of the Niagara Falls Smelting & Refining Corp., Buffalo, the past six years was chief chemist and metallurgist superintendent of foundries and rolling mills for McNab & Harlin Mfg. Co., Paterson, N. J. Previous to that time Mr. Jarvis was with the International Harvester Co. of Canada, the Canadian Westinghouse Co., Canadian Inspection & Testing Laboratory, Montreal, and other concerns.

J. L. Hill has been placed in charge of the district sales office recently opened at Dallas, Tex., by the McWane Cast Iron Pipe Co., Birmingham, Ala.

J. U. Fogle has been elected president of the Aultman-Taylor Co., Mansfield, O., to succeed J. E. Brown, who continues as chairman of the board of directors.

George H. Fristoe, for 10 years with the Stocker, Rumely, Wachs Co., machinery dealer, Chicago, and as sales manager for the past three years, has resigned his position and will engage in other business.

R. P. Dryer, as district manager, will represent the Whiting Corp., and its subsidiary companies, Swenson Evaporator Co. and the Grindle Fuel Equipment Co., in the new offices being opened at 624 Penton building, Cleveland.

Harry F. Hildreth has been elected treasurer and clerk of the G. F. Wright Steel & Wire Co., Worcester, Mass., succeeding the late Herbert N. Wright. D. Willard Leavitt has been elected to the board of directors.

John F. Tinsley, vice president and general manager of the Crompton & Knowles Loom Works, Worcester, Mass., received the honorary degree of master of arts at the commencement exercises at Holy Cross college, Worcester, June 20.

C. C. Rosser, who for many years has been connected with the Detroit Seamless Steel Tubes Co., Detroit, has been appointed district sales manager at Cleveland for the company. His offices are at 1206 Guardian building.

Clarence S. Siebert, for a number of years connected with the Superior Sheet Steel Co., Canton, O., recently joined the organization of Waldo, Egbert & McClain, Buffalo. He will act in the capacity of special steel representative with headquarters at Buffalo.

M. C. Sargent, formerly connected with Waldo Bros. & Bond Co., Boston, has been placed in charge of the New England office of the General Refractories Co., Philadelphia, recently opened at 200 Devonshire street, Boston.

Frank Newman Speller, metallurgical engineer, National Tube Co., Pittsburgh, has been given an honorary degree of doctor of science by the University of Toronto. Mr. Speller has been identified with research work on the corrosion of steel for a number of years.

William L. Hoffman, dealer in mill, mine and railroad supplies, 1225 Land Title building, Philadelphia, has been appointed representative in that territory for the J. W. Brainard Steel Co., Warren, O., specializing in small structural and high grade cooperage rivets.

Calvin L. Jones, welding engineer of the Westinghouse Electric & Mfg. Co., Atlanta, Ga., has been elected vice president of the American Welding society. Mr. Jones has been elected for a two-year term and will be in charge of the activities of the society in the south-ern division.

Loren M. Cowdrey formerly of Cowdrey & Winkhaus, New York, exporters, has joined the organization of Frazar & Co., New York, which recently acquired the foreign business of the former company and which will be conducted under Mr. Cowdrey's personal supervision.

H. Asano and Y. Suzuki, officers of the Asano Shipbuilding Co., Ltd. of Japan, who are making an international tour to study post-war conditions affecting business, were visitors in Pittsburgh recently. They visited plants of the Carnegie Steel Co. and the National Tube Co.

Joseph L. Scholl, formerly with the Pittsburgh office of Niles, Bement, Pond Co., in the sale of machine tools, but more recently identified with the McCoy-Brandt Machinery Co., Pittsburgh, has become affiliated with the Reliance Machinery Sales Co., Brighton road, Pittsburgh.

George A. Gaylord, treasurer and general manager of the Vitrified Wheel Co., Westfield, Mass., has resigned to take effect not later than Aug. 1. He has been general manager 25 years, treasurer for two years and was president of the original company, which was reorganized two years ago.

E. H. Smith, treasurer of H. B. Smith Mfg. Co., Westfield, Mass., has just been elected president of the Massachusetts state chamber of commerce. Mr. Smith has been associated with his father in the manufacture of radiators in Westfield, Mass., for many years. He has been president of the Westfield chamber of commerce.

Philip O. Geier, treasurer of the Cincinnati Milling Machine Co., Cincinnati, has been appointed a member of the Cincinnati rapid transit commission, succeeding Judge W. A. Geoghegan, deceased. Mr. Geier will serve the balance of the term of Judge Geoghegan which expires Nov. 15, 1928.

Charles H. Williams, president of Williams Agramonte & Co., Inc., 44 Whitehall street, New York, successor to the American Iron Products Co., exporter, has arrived in Havanna, where he plans to spend the next six months developing various agencies which he has secured for the company to sell steel in Cuba.

B. G. Tremaine, co-manager of the National Lamp Works, Cleveland, was elected a director of the General Electric Co., June 22 at a meeting of the board of directors of the latter company in New York. The Lamp works is a part of the General Electric Co. having been absorbed in 1912. Mr. Tremaine was one of the organizers of the Lamp works in 1901 and has been its co-manager since that time. He is vice chairman of the advisory board of the National Lamp Works.

William L. Hirsch, who has been affiliated with the iron and steel industry, chiefly in connection with wire and wire products, for about 45 years, has resigned as sales agent at Pittsburgh for the American Steel & Wire Co. He is taking an extended rest and some-

time in July will return to serve his company in a consulting capacity. His duties as Pittsburgh sales agent have been assumed by Edward A. Niben, who has been connected with the American Steel & Wire Co. since its acquisition by the United States Steel Corp., and prior to that time with its predecessor, the Consolidated Steel & Wire Co. at its mill. For some time past, Mr. Niben has been manager of the merchants' sales department of the American Steel & Wire Co. at 30 Church street, New York.

Reginald Washburn, treasurer and general manager of the Washburn Co., Worcester, Mass., sailed from New York, June 27, to pass the summer in Europe.

J. C. Bloomfield, who for a number of years was connected with C. H. Hart & Co., Chicago, contractors, recently was placed in charge of the Chicago office of the Industrial Works, Bay City, Mich., at 1051 McCormick building.

W. H. A. Austin, secretary of the Eastern Steel Co., Pottsville, Pa., has assumed direction of sales in the territory covered by the New York office, replacing C. F. Fay, resigned. Mr. Austin has been connected with the company in various capacities since 1907.

Samuel H. Moore, vice president and general manager of the Chisholm-Moore Mfg. Co., Cleveland, has departed for the continent after a brief visit to London. Mr. Moore expects to visit various countries in Europe before returning to the United States from Cherbourg on the MAJESTIC, July 4.

Magnus W. Alexander of the National Industrial Conference board, is in England for the purpose of studying industrial conditions with special reference to the reactions of Europe on the world business and economic situation. While in London Mr. Alexander was entertained at the house of commons and by various prominent business men in Great Britain.

T. E. Schwening, superintendent, and William C. Doering, assistant superintendent of the Vitrified Wheel Co., Westfield, Mass., have resigned their respective positions. Rudolph J. Hein, secretary of the Maxf Grinding Wheel Corp., Chester, Mass., is expected to succeed George L. Gaylord, treasurer and general manager of the company, who recently resigned.

F. A. Collins has resigned as executive assistant and office manager of the sales promotion section of the War department, to become eastern manager for the Commercial Bulletin Publishing Co., Minneapolis and St. Paul. His offices will be in New York. For the past three years he has been connected with the office of the director of sales, during which period the War department has liquidated and disposed of a vast surplus of war material.

William C. Frye, president of the Chain Belt Co., Milwaukee, has retired and has been succeeded by C. R. Messinger, vice president and general manager since 1917. Mr. Frye has retired after an active association with the company for 28 years. During this period he held practically all of the important executive positions and at the time of his election to the office of president in 1916 was treasurer of the company. Under his leadership the company continued the steady growth inaugurated by C. W. Levally,

C. R. MESSINGER

its founder and first president, and today it is one of the largest producers of chain, concrete mixers and conveying machinery in the country. C. R. Messinger, who succeeds Mr. Frye, became associated with the Chain Belt Co., in 1917 after serving eight years as general manager of the Sivyer Steel Casting Co. Mr. Messinger also is president of the Interstate Drop Forge Co., vice president of the Sivyer Steel Casting Co., and the Federal Malleable Co., and is a director of the Nugent Steel Castings Co., of Chicago, and the First Wisconsin National Bank of Milwaukee. Mr. Messinger is a past president and a director of the American Foundrymen's association and also is prominent in the affairs of the American Malleable Castings association.

Dr. Edward P. Hyde, director of research of the National Lamp Works, Cleveland, division of the General Electric Co., Schenectady, N. Y., resigned July 1 after 15 years of service with the company. Dr. Hyde, who is 44 years old, organized the National Lamp Works research laboratory in 1908 and later was made director of research in charge of all the General Electric Co.'s laboratories. On July 7 he will sail for Europe where he plans to spend a year in France and Switzerland. His successor has not been announced as yet.

F. M. Feiker, formerly vice president of the McGraw-Hill Co., Inc., New York, and more recently on leave of absence as special agent to the department of commerce at Washington, after his return from Washington will be associated with the staff of the Society for Electrical Development, New York. Mr. Feiker will continue a consulting relation with the McGraw-Hill Co. and he will continue in a similar capacity his relation to the problems of personnel and organization of the department of commerce.

Franklin S. Terry, co-manager of the National Lamp Works, Cleveland, who was elected vice president of the General Electric Co., parent company of the National works, June 22, was one of the organizers of the lamp works in 1901. He has been its co-manager since that time, remaining at the head when the General Electric Co. absorbed the works in 1912. Mr. Terry is chairman of the advisory board of the National Lamp Works.

U. E. Kanavel has disposed of his interest in the Peerless Sand Co., Conneaut, O., and retired from active business because of ill health. He has been affiliated with the molding sand business for 35 years, and gained his first experience at Zanesville, O., where he was connected with the Ayres Mineral Co. for 18 years. Later he was manager of the Interstate Sand Co., Cleveland, for six years. Prior to the incorporation of the Peerless Sand Co., five years ago, Mr. Kanavel was affiliated with the Gordon Sand Co. of Conneaut. He will continue his residence in Conneaut.

P. J. Freeman is establishing offices as a consulting engineer at 311 Ross street, Pittsburgh. He has already been retained by the Standard Inspection Co., Pittsburgh, to act as consulting engineer on problems relating to concrete materials and construction, and tests of power plants and pumping machinery. Mr. Freeman was graduated from University of Illinois in 1907, and later received a professional degree of M. E. from the same institution. For the last seven years he has been engineer of tests in the Pittsburgh Testing Laboratory.

In What Direction Is Business Headed?

(*Concluded from Page 47*)

maintains we should not be frightened by figures of industrial activity far in excess of those that would be implied alone in a normal growth of population. Normalcy is a vastly higher and more comfortable standard than in 1913, he asserts. This standdard is strikingly emphasized by the fact that the United States with but 6 per cent of the world's population consumes 50 per cent of the world's metals. That reflects an enormous and ever growing power of consumption.

From 1900 to 1920 the volume of factory production in the United States increased 95 per cent while population increased only 40 per cent. It is computed that the average American home has three times the articles of human use as 20 years ago. Witness plumbing, telephones, phonographs and the automobile. Of the latter 84 per cent of the world's registration of cars is in America.

Some authorities maintain that America's industrial capacity since 1913 has been overexpanded. The facts are difficult to ascertain. For 15 years before the war, however, it is estimated that the average rate of industrial expansion was twice that of population. Since 1913 the population of the country has increased by 15 per cent. If the normal prewar rate of expansion had been maintained over the 10 years since 1913 the increase in capacity would be 30 per cent. In addition there is a normal increase of about 4 per cent annually for amortization. Since most estimates of the expansion of industry during the war place the total at about 30 to 35 per cent, it is evident that important abnormal capacities do not now exist.

The expansion in pig iron producing capacity since 1913 measured by the increase which the May output of this year showed over the peak production of 1913, has been only 36 per cent. In the 10 years from 1900 to 1910 the increase from peak to peak in blast furnace production was 108 per cent.

Unquestionably the standards of living and the great strides of industrial production have created a desire and the ability on the part of the American people to consume goods on a stupendous and rising scale. Will this consumption be sufficiently high to continue to absorb the outputs, which in recent months have been providing for depleted stocks as well for current consumption?

The modern industrial machine is imperfectly adjusted in its contacts between supply and demand. Industry must be prepared to meet the peak loads and to withstand the shock of dull times. Depressions bring shortages of goods. Recovery results in a rush to make up these shortages. Production is geared at top speed. This usually is higher than average consumptive needs. Once the shortages have been filled in, peak production is no longer justified. It could not be profitably maintained indefinitely. It is only continued, after goods shortages have been made up, by inflation of credit and prices. This is unhealthy. It tends to create large surpluses which eventually must be thrown upon the market as in 1920.

At the present time producers who have made good the depletion of stocks are beginning to slow down. The incentive to continue increasing output would come from rising prices. But prices are not rising. They have been falling for three months. This has created uncertainty respecting future values and demand.

As a result, manufacturers are disinclined to produce. Distributors are equally disinclined to buy, beyond present needs. Goods are not being stocked. There is no speculative accumulation of stocks. At the same time the rate of consumption continues large. The federal reserve board reports that in May wholesale trade increased 14 per cent. Mail order sales have been 50 per cent in excess of one year ago.

In this condition, as outlined, business has its strongest safeguards against sharp declines. With no heavy stocks to throw upon the market, with credit pressure lacking to compel holders to liquidate what stocks they do hold, with output being curtailed where it is now showing signs of becoming excessive and with consumption large, there is no possibility of a crash in values or a drastic decline in trade as in 1920. That is why the reduced operations in automobiles, textiles, tires and some other lines may be regarded as favorable.

Under the present organization of industry peak outputs are not long possible. The tendency this year probably will be for production to seek the line of normal consumption. Where this line lies with reference to recent tremendous levels of activity, no one can say. It is possible that it lies much nearer to these tops than many people now suspect.

Obituaries

WILLIAM H. GIBBONS of Ardmore, Pa., formerly vice president and treasurer of the Pulaski Iron Co., Philadelphia, died suddenly at Plymouth, England, on June 20. Mr. Gibbons, who was born in September 1852, was a grandson of Martha Lukens, founder of the Lukens Steel Co. Upon graduating from Haverford college he immediately became connected with Lukens organization. Later he was connected with the Parksburg Iron Co., Parksburg, Pa., eventually becoming president of that organization. Some time later he was president of the Eastern Steel Co., Pottsville, Pa., and for the past few years he was vice president and treasurer of the Pulaski company. About two years ago he resigned his connection with the company when it was disposed of to other interests.

John H. McGill, president of Lombard & Co., Boston, died recently at his home in West Medford, Mass.

Philip W. Jones, superintendent of the Buckeye Rolling Mill Co., Newark, O., died of apoplexy June 24.

John D. Merrill, secretary and treasurer of the E. R. Merrill Spring Co., New York, on June 18 died. His death had been unexpected.

John Eckert, president of the Milwaukee Forge & Iron Co., Milwaukee, died June 22 at a Milwaukee hospital. He was 44 years old and had been ill about three years.

Phillip W. Jones, superintendent of the Buckeye Rolling Mill Co., Newark, O., died June 24 at a hospital in that city. He was 62 years old and had been ill two weeks. Mr. Jones was connected with the iron and steel industry for more than 40 years. He became connected with the Buckeye company in 1910.

James P. Marsh, formerly president of the James P. Marsh Co., manufacturer of steam specialties, Chicago, died June 27 at the age of 82. He was born in Yonkers, N. Y., and removed to Chicago in 1860. Shortly after reaching Chicago he founded the business which bears his name, at the location where it has been ever since.

William J. Ladd, for many years treasurer of the Bigelow group of copper mines in Michigan, now owned by the Calumet & Hecla Co., Inc., New York, and formerly general auditor of the Chicago, Burlington & Quincy railroad, died June 25 at his home in Milton, Mass. He was 79 years old.

Steelworks Wages Compared

Decrease in Hourly Earnings at Bar Mills from 1920 to 1922 Given by Bureau of Labor Statistics as 31 Per Cent; Plate Mills, 30; Open-hearth, 28 —Index Numbers for Seven Departments

HOURLY earnings of workers in open-hearth works in 1922 as compared with earnings in 1920 decreased 28 per cent, and in bessemer converters, 31 per cent according to a summary of wages and hours in seven departments of the American iron and steel industry issued by the bureau of labor statistics, department of labor.

The decrease in hourly earnings in bar mills in 1922 as compared with 1920 was 31 per cent; in plate mills, 30 per cent; in puddling mills, 45 per cent; blooming mills, 27 per cent, and standard rail mills, 23 per cent.

Although a decrease in hourly earnings is shown in each department, in comparing 1922 with 1920, a comparison of 1922 with 1913 shows that wages per hour in 1922 still were much higher than in the prewar period. The following increases in 1922 over 1913 are shown by departments as follows: Open-hearth furnaces, 102 per cent; standard rail mills, 96 per cent; plate mills, 86 per cent; bessemer converters, 66 per cent; bar mills, 73 per cent; and blooming mills, 69 per cent. Figures for 1913 are not available for puddling mills, but compared with 1914, hourly earnings in 1922 were 53 per cent higher.

The customary full-time hours worked show the following decreases in 1922 as compared with 1920: Puddling mills, 7 per cent; plate mills, 4 per cent; standard rail mills, 3 per cent; and bessemer converters and bar mills, each 1 per cent. For open-hearth furnaces and blooming mills there was an increase of 4 per cent.

The accompanying table presents index numbers resulting from a combination of the data for the several principal productive occupations. The index numbers are based on the figures for 1913 equaling 100, except in the case of puddling mills, where 1914 is taken as 100.

Iron and Steel Wage Index Number

[1913=100, except puddling mills where 1914=100.]

	Customary full-time hours per week	Earnings per hour	Full-time earnings per week
Bessemer converters			
1907	102	85	86
1908	98	79	79
1909	102	82	84
1910	103	86	88
1911	101	82	84
1912	101	90	90
1913	100	100	100
1914	98	90	90
1915	98	94	94
1917	98	151	149
1919	95	208	218
1920	99	241	254
1922	98	166	176
Open-hearth furnaces			
1910	99	89	86
1911	96	89	85
1912	98	92	91
1913	100	100	100
1914	97	100	97
1915	92	104	96
1917	99	152	150
1919	98	239	234
1920	89	282	253
1922	93	202	188
Puddling mills			
1914	100	100	100
1915	98	96	94
1919	98	269	260
1920	103	279	295
1922	96	153	154
Blooming mills			
1910	102	81	83
1911	101	82	84
1912	101	87	88
1913	100	100	100
1914	97	102	98
1915	97	104	100
1917	100	133	131
1919	96	220	217
1920	91	233	220
1922	95	169	166
Plate mills			
1910	99	89	88
1911	98	87	85
1912	100	92	91
1913	100	100	100
1914	99	101	100
1915	99	107	106
1917	100	156	156
1919	102	233	237
1920	99	267	265
1922	95	186	175
Standard rail mills			
1910	104	90	92
1911	100	89	88
1912	100	89	90
1913	100	100	100
1914	99	99	98
1915	100	97	96
1919	96	221	215
1920	89	256	235
1922	86	196	171
Bar mills			
1907	106	94	99
1908	106	84	89
1909	107	86	91
1910	104	95	99
1911	106	90	93
1912	103	90	93
1913	100	100	100
1914	100	96	97
1915	100	98	98
1919	103	214	221
1920	99	252	253
1922	98	173	171

Puddling Rate Advanced to $13.88 Per Ton

Puddlers employed in the mills represented by the Western Bar Iron association will receive $13.88 a ton in July and August, an advance of $1.76 over the rate of $12.12 in effect in May and June. The increase in the base rate at the recent conference at Atlantic City between representatives of the association and employes accounts for $1 of the advance for the next two months. The puddling rate at the peak in January and February, 1921, was $18.70, while the general average for 1914 was $5.60. The finishing mill workmen will get an advance of 7½ per cent for July and August.

The average selling price of bar iron in May and June, on which the new puddling rate is based, was 2.50c a pound compared with 2.35c for the preceding period. Following are further comparisons of average selling prices:

	1923	1922	1921	1920	1919
Jan.-Feb.	2.25c	1.60c	2.80c	2.55c	3.10c
Mar.-Apr.	2.35c	1.50c	2.55c	2.70c	2.75c
May-June	2.50c	1.60c	2.30c	3.00c	2.50c
July-Aug.		1.70c	1.85c	3.25c	2.50c
Sept.-Oct.		1.95c	1.70c	3.40c	2.50c
Nov.-Dec.		2.20c	1.65c	3.55c	2.50c
Yearly average		1.76c	2.14c	3.08c	2.64c

There will be no curtailment of present sheet, tin plate or puddling operations due to labor troubles this year, according to a report from Youngstown. It was learned from a reliable source that all of the companies which now are signatories of the agreements with the Amalgamated Association of Iron, Steel and Tin Workers have already signed the new agreement for the year beginning July 1.

Court Permits Stripping of Hibbing for Ore

Duluth, July 3.—The Oliver Iron Mining Co., subsidiary of the United States Steel Corp., has obtained permission through a court order to strip North Hibbing to mine iron ore. Property owners who sued for $6,000,000 damages lost their case, though $296,840 was awarded the town for damage to street improvements. The court found that 20,000,000 tons of iron ore underlies the 40 acres about to be stripped, in addition to 13,000,000 tons in the supporting slopes.

The new town of Hibbing was built several years ago just south of the old town, and practically all of the buildings on the north location have been moved or razed. A series of legal contests occurred from the time the Oliver company began to purchase land rights, and stood in the way of the beginning of actual mining operations.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

ANNOUNCEMENT has been made by the Franklin Machine Co., Providence, R. I., of its recent purchase of the American & British Mfg. Corp., including the latter's original drawings and patterns. The Franklin company was established in 1798 and in 1885 was incorporated. It is one of the oldest manufacturers of machinery and iron castings in Rhode Island. In 1916 it was taken over by new management and in 1918 the growth of the business necessitated expansion of its plant and the William A. Harris Steam Engine Co., Providence, was absorbed with all records, drawings and patterns of the Harris-Corliss stationary engine. The company's acquisition of the American & British corporation patterns and drawings, enables it to furnish the trade with either Harris-Corliss, George H. Corliss, Green-Wheelock or American diesel type engine units.

* * *

GROUND for a new plant at Greenwood, Ind., for the Indianapolis Pump & Tube Co., Kentucky avenue and Drover street, Indianapolis, recently was broken. It is expected the new plant will be ready for occupancy about Dec. 1.

* * *

ANNOUNCEMENT has been made that the foreign business of Cowdrey & Winkhaus, New York, exporters, has been taken over by Frazar & Co., New York, manufacturers' exporters. Loren M. Cowdrey with his staff has joined the Frazar organization and the business will be conducted under his personal supervision.

* * *

TWO underfeed stokers will be installed at the Mingo plant of the Carnegie Steel Co., Mingo Junction, O. The stokers will heat two 1000-horsepower boilers, the equipment including steam operated power dumping grates, extension sidewall tuyeres and automatic secondary fuel bed rams. The stokers will be built by the Westinghouse Electric & Mfg. Co.

* * *

ENLARGEMENT of its boiler plant will be undertaken by the Washburn Wire Co., Phillipsdale, R. I. Two 720-horsepower fire tube boilers of the Springfield type with the new model Westinghouse underfeed stokers have been purchased. The fans have been ordered from the Buffalo Forge Co., Buffalo. The blowers and motors will be connected by Thomas type couplings.

* * *

THE LINDELL DROP FORGING CO., Lansing, Mich., which succeeds the former company of that name, has acquired six acres and plans a number of large buildings. Production of forgings is expected to begin in October. One building 60 x 300 feet will be contracted for soon. Plans for a power house and shear house have been drawn. The company will use 10 hammers in its initial operations.

* * *

OPERATIONS at its Buffalo plant have been started by the Niagara Falls Smelting & Refining Corp. and the company now is in a position to make immediate shipments of all standard alloys. A department exclusively devoted to the manufacture of special alloys to customers' specifications is being maintained, in combination with a well equipped metallurgical research laboratory. Ernest G. Jarvis is vice president and general manager of the company.

* * *

ELECTRICALLY operated dump trucks, used for transferring ore from bins to the skips, recently were installed at the Lucy blast furnaces of the Carnegie Steel Co., Pittsburgh, replacing three to five bottom fillers per furnace. Action in this direction was brought about by the shortage of labor. This method of ore handling also is employed at the No. 2 stack of the Carnegie group of blast furnaces at New Castle, Pa., and at the Mingo group at Mingo Junction, O.

* * *

ALL officers and directors of the Kokomo Steel & Wire Co., Kokomo, Ind., were re-elected at the annual meeting of the stockholders held recently. The attendance of stock holders was larger than in most previous years. Directors re-elected are: A. A. Charles, George W. Charles, A. L. Thalman, A. B. Armstrong, A. V. Conradt, J. W. Johnson and J. E. Fredrick, all of Kokomo; S. E. Raun, of Indianapolis, and F. E. Wickenheiser, Huntington. A. A. Charles is president; Mr. Conradt, vice president; J. E. Fredrick, secretary and general manager; George W. Charles, treasurer, and S. S. Shambaugh, assistant treasurer.

* * *

THE construction program now under way at the Homestead works of the Carnegie Steel Co., Munhall, Pa., includes eight 834-horsepower Stirling boilers fired by individual underfeed stokers of the Westinghouse type. The stoking equipment includes steam power refuse dumping mechanisms, nonclinkering extension sidewall tuyeres and automatic secondary ram fuel bed control adjusting mechanisms. Vertical steam engines of the Engberg type will drive the forced draft fans.

* * *

REORGANIZATION of the merger of the Halligan Pipe & Supply Co., Chicago, and the Federal Pipe & Supply Co., that city, recently was completed with the election of the following officers: President and treasurer, George J. Halligan; vice president, George Mason; secretary, Thomas A. Callaghan and sales manager, Harry E. Shoff. The merged companies are engaged in the jobbing of pipe, valves, fittings, etc., and the fabricating of industrial piping. Mr. Halligan was the founder of both organizations and a number of years ago was connected with the Western Pipe & Supply Co. Mr. Shoff was formerly vice president of George B. Limbert & Co.

* * *

FORMAL application has been made to the Wisconsin public utilities commission by Edsel Ford, president of the Ford Motor Co., Detroit, for a permit to build and operate a dam and hydroelectric plant on the Menominee river in Florence county, Wis., which will produce 25,000,000 kilowatt hours a year. The dam is to be 30 feet high and 400 feet long. The energy will be used by the Michigan Iron, Land & Lumber Co., a Ford subsidiary which operates a large sawmill, planing mill, body and stock factories at Iron Mountin, Mich. The Ford interests now are erecting additional buildings at this point at a cost of about $4,500,000.

Slump Hits Machine Tool Market

Seasonal Falling Off Brings Total Volume of Business for June Below that for May —Sales Confined to Lists Having Small Number of Tools—Satisfactory Condition Continues in Used Machinery Market

REPORTS from various dealers of machine tools and shop equipment throughout the country show that sales during the past week have been exceedingly light. The volume of business transacted during June will fall considerably below the total for the month of May. This dullness is attributed in most cases to the usual seasonal slump, although it is reported that in some sections, users of this type of equipment are delaying buying at long as possible in the hopes of securing concessions below the present price levels. The labor shortage is placing a handicap on the manufacturer, making it difficult to keep the machines, already on hand, on operation.

A number of sales of one or two tools have been made during the week, the bulk of the business being done in the New York district. Orders placed include a fair amount of equipment for the railroads. The Southern Pacific, the Tennessee Central, the Virginian, the Central of New Jersey, the Florida East Coast, the Chicago, Rock Island & Pacific, the Boston & Albany and the Nickel Plate railroads are among those buying tools. Other buyers include the Bush Terminal Co., New York, Baldwin Locomotive Works, Eddystone, Pa., De La Vergue Machine Co., New York, the Westinghouse Electric & Mfg. Co., Pittsburgh, the Atlas Steel Corp., Dunkirk, N. Y., and the United States Steel Corp. While a number of lists are now before the trade, buying is being deferred and few new inquiries are developing. With this situation confronting them, dealers do not look for any active revival of business during the month of July.

Sales of equipment in the used machinery market, on the other hand, are keeping up, although in most cases confined to a small number of tools. Inquiries continue to be brought out from time to time the greater part coming from manufacturers. Notwithstanding the continuance of sales in this market, the volume of business for June will not equal that for the month of May.

Railroads Close for Small Number of Tools

NEW YORK, July 3.—The local machine tool market continues to reflect the usual seasonal dullness, although trading is not as inactive as expected some time ago. One large manufacturer reports that June was the second best month his company had experienced this year, and further asserts that the quarter just ended showed only a slightly falling off from the preceding period. Another large manufacturer, with headquarters in this city, reports that June, while a fairly good month, was somewhat less active than May, which for this particular interest was the best month this year. This latter interest further states that the business for the second quarter was as good if not better than the first period of the year.

A fair amount of scattered railroad business is noted in the activity of the past week. The Southern Pacific has closed on a 90-inch driving wheel lathe and a large quartering machine; the Tennessee Central on an 18-inch crank slotter; the Virginian railroad, a 500-ton double hydraulic car wheel press; the Central of New Jersey, a 42-inch planer; the Florida East Coast, a 42-inch boring mill; and the Chicago, Rock Island & Pacific, a 53-inch boring mill. Included in other miscellaneous buying are a 16-inch lathe for the Bush Terminal Co., New York; two 6-foot radial drills for the Baldwin Locomotive Works, Eddystone, Pa.; and a horizontal boring and drilling machine for the DeLa Vergne Machine Co., New York.

Calendar and Selected News of Plant Liquidations, Wholesale Offerings, Auctions of Used and New Equipment, Etc., Page 114, Classified Machinery Section.

Activity in cranes has slowed up somewhat, there being fewer awards and inquiries. An outstanding contract calls for six electric overhead cranes for the Otis Elevator Co., this business being placed with the Bedford Foundry & Machine Co., through Philip T. King, 30 Church street.

Fair Activity Continues

PITTSBURGH, July 3.—A fair amount of activity continues to be noted from week to week in the machine tool and equipment market. The feature of this present week is the buying now well under way on 75 tools for the Westinghouse Electric & Mfg. Co.'s Sharon, Pa. transformer plant. Several orders have been distributed among different dealers here, including Manning, Maxwell & Moore, Inc., a small punch and shear; McCoy-Brandt Machinery Co., two millers; Somers, Fitler & Todd; Brown & Zortman Machinery Co., Consolidated Machine Tool Corp., Motch & Merryweather Machinery Co., and W. K. Stamets, such items as planers, grinders, radial drills, milling machines, etc. Buying is expected to develop this current week on the list of 22 tems for the Pttsburgh Board of Educaton to be installed in the Westinghouse high schools. Bids closed June 28.

The majority of sales, however, consist of one item each such as a lathe, radial drill, drill press or grinder, many plants ordering a machine or two to fill out their immediate equipment needs. One manufacturer located nearby closed on three items however, this past week. Numerous sales consist of special machinery such as for instance a grinder about to be closed here which involves the expenditure of $8000 or $9000. The Atlas Steel Corp., Dunkirk, N. Y., bought a Sutton-Abramsen stretcher through Manning, Maxwell & Moore, Inc. The Union railroad recently closed on a 52-inch car wheel borer and another United States Steel Corp. unit bought a large lathe. Other recent sales of new equipment include a 32-inch shaper, an 80-pound hammer and an air-type boring mill.

Selling proceeds in good volume in connection with used machinery. A grinder was sold here in town; a slab miller to another dealer for delivery in

Indiana and a No. 6 used Becker milling machine was sold nearby, the same seller disposing of a punch press and an air compressor. Another dealer disposed of a pipe machine, punch and shear and radial drill. One or two good sized lists are out, one from a nearby machine shop for a complete line of equipment contingent upon the booking of a certain order, and another from a central Pennsylvania user involving a larger number of items. Included in the equipment sold from the plant of the Carbon Steel Co. is a 20-ton Shaw crane to the Reliance Coke & Furnace Co. More remain to be sold. Several new cranes have been awarded including two single installations.

Market Extremely Quiet

CLEVELAND, July 3.—General business conditions in the machine tool market in this district are extremely quiet. Only a few sales were completed during the past week, confined in the main to one or two small tools. The falling off in business is accredited to the usual seasonal slump usually experienced during July and August. Dealers report that June business fell considerably below the volume of sales completed during the month of May. A noticeable decrease is also found in the number of inquiries being brought out. Railroad buying in this district has slumped greatly, and the automotive industry is making practically no inquiries. Sales are confined almost entirely to manufacturers. The Nickel Plate railroad has purchased a list of four tools consisting of two drills, a shaper and a lathe for its Bellevue, O., roundhouse. A Cleveland manufacturer purchased a small lathe. With an exceptionally small number of inquiries current, and those now before the trade calling for a relatively small number of tools, dealers are not expecting an exceptional increase in the volume of sales during July.

While sales of used machinery are limited mostly to small tools, dealers report the turnover as being satisfactory. While some dealers report June business equal to that during May, others say that there has been a slight decrease in sales during the past month.

Small inquiries, however, are being brought out in sufficient numbers to cause dealers to anticipate no great falling off in business in the immediate future. Some dealers feel that the business in early fall will exceed the turnover during the past three months. Sales include a large boring mill to an Ohio manufacturer and a 32-inch drill press to the Nickel Plate railroad.

June Business Falls

CINCINNATI, July 3.—The volume of June business booked by manufacturers of machine tools is smaller than the May total. July prospects are even less. Close market observers are inclined to feel price advances recently have been too rapid for a healthy growth of the machine tool demand. On the other hand, building costs are high and with contractors rushed by an extraordinary movement in favor of new homes, apartment and commercial buildings, industrial expansion is held back. Another reason is the feeling of caution among manufacturers of the possibilities of overexpansion. Consequently there is not a real broad market for tools and business remains more prospective than actual. Various interests actually need equipment but have deferred buying because of labor shortages, being unable to operate plants to full capacity. Due to the cessation of activity in most of the machine tool plants, the industry is not feeling the effects of the labor shortage as a month ago. However, skilled mechanics are still scarce and those available are demanding salaries which do not prevail in this district.

Demand for used equipment also has eased off. The Hanna Stoker Co., with headquarters at Cleveland, has closed with the E. A. Kinsey Co. of this city for the outfitting of its new plant in Oakley along the Baltimore & Ohio railroad. Railroad inquiry is comparatively light in this district.

Buyers Mark Time

BOSTON, July 3.—Something in the nature of a buyers' strike exists in the machine tool market. Industrial activity continues at a healthy rate and many manufacturers are in

Crane Awards and Inquiries of the Week

Orders Placed

One 10-ton, 3 motor cage operated electric traveling crane having a 60-foot span, for the Empire Steel Construction Co., Shreveport, La., to Alfred Box & Co., Inc., Philadelphia.

Two 5-ton, 3 motor traveling cranes, 28-foot span, for the Philadelphia Rapid Transit Co., Philadelphia, to Alfred Box & Co., Inc., Philadelphia.

Two 20-ton, 2 motor cranes trolleys for the Philadelphia Rapid Transit Co., Philadelphia, to Alfred Box & Co., Inc., Philadelphia.

Sixteen 7½-ton, 1 motor traveling cranes, 17-foot span, for the Denver, Rio Grande & Western railroad to Alfred Box & Co., Inc., Philadelphia.

Two 7½-ton, 2 motor traveling cranes, 14-foot span, for the Denver, Rio Grande & Western railroad to Alfred Box & Co., Inc., Philadelphia.

Four cranes purchased by the General Electric Co., Schenectady, N. Y. plant from Alfred Box & Co., Inc., as follows: One 15-ton, 3 motor, 46-foot span; One 10-ton, 3 motor, 46-foot span; Two 5-ton, 3 motor, 46-foot span.

One 25-ton locomotive train for the Kimberly Clark Co., Lena, Wis.; to the Browning Co., Cleveland.

One 25-ton locomotive train for the Rhinelander Paper Co., Rhinelander, Wis., to the Browning Co., Cleveland.

One 4-ton monorail hoists, cage controlled, for the Interboro Rapid Transit Co., New York, to the Shepard Electric Crane & Hoist Co.

One 5-ton, 3-motor crane, 14-foot span, and one 1-ton, 1-motor crane, 17-foot span, for Jenkins Bros., Bridgeport, Conn., to the Northern Engineering Works. A transfer crane and a 2-ton, 1-motor crane, are at least temporarily deferred.

One 4-ton grab bucket crane, 34-foot span, for the West Penn Power Co., Pittsburgh, to the Milwaukee Electric Crane & Mfg. Co.

Three special cantilever gantry cranes, each weighing about 100 tons and equipped with two 5-ton trolleys, for the Wilson dam development, Florence, Ala., purchased through U. L. Copper & Co., engineers, 101 Park avenue, New York City, from unnamed builder.

Six electric overhead cranes for the Otis Elevator Co., New York, to the Bedford Foundry & Machine Co., through Philip T. King, 30 Church street, New York. Specifications call for one 7½-ton crane with 57-foot, 6-inch span, for Yonkers, and five 5-ton cranes for Quincy, Ill., three of which will have 47-foot, 6-inch span; one 48-foot span and another 47-foot span.

Seven handpower cranes have been placed by a Missouri dealer with the New Jersey Foundry & Machine Co.; four of 4-ton capacity, 27-foot span; two of 6-ton capacity, with 47-foot and 52-foot spans, respectively and one of 2-ton capacity, with 22-foot span.

One 620-foot monorail system, equipped with trolleys and hoists for a manufacturer in the metropolitan district in New York, to the New Jersey Foundry & Machine Co.

One used Browning locomotive crane for the National Cement Co., Birmingham, to an unnamed builder.

One 25-ton used Browning crane for the Empire Builders Supply Co., Niagara Falls, N. Y., to the Hoisting Machinery Equipment Co., 50 Church street, New York.

One 15-ton used Brown Hoist Locomotive Crane for the Barber Asphalt Co., Philadelphia, to an unnamed dealer.

Two pile drivers, Nos. 2 and 4, respectively, for the Southern Pacific railroad, to the Industrial Works.

One 20-ton used Shaw crane from the Carbon Steel Co. plant, Pittsburgh, to the Reliance Coke & Furnace Co.

One 4-motor, 33-foot, 10-inch span, 2½-yard grab bucket crane for the West Penn Power Co., Springdale, Pa., through the Pittsburgh office of the Milwaukee Electric Crane & Mfg. Co.

One 30-ton 2-motor electric traveling crane with 33-foot span for the Olean Electric Light & Power Co., Olean, N. Y., through the Pittsburgh office of the Milwaukee Electric Crane & Mfg. Co.

One 10-ton and two 3-ton cranes for the Westinghouse Electric & Mfg. Co., to the Northern Engineering Works.

Two 5-ton cranes for the Westinghouse Electric & Mfg. Co., to the Whiting Corp.

Orders Pending

One electric gantry crane for the Schenectady, N. Y., plant of the General Electric Co., bids asked.

One 10-ton, 31-foot span, electric overhead crane of rather special type, for the Third Avenue Railways, New York; the crane is for the Kingsbridge car house.

One 5-ton handpower crane, 40-foot span, for the Honolulu Iron Works, Woolworth building, New York, bids asked.

need of tools, yet buying of new tools is almost at a standstill. Tool manufacturers continue to hold prices firm in the face of the lull in buying and apparently tool users feel that prices should decline and are holding up orders as long as possible in the hope of securing concessions below the present levels. New England railroads have recently been inquiring for prices and apparently several modest orders are in the making. The Boston & Albany railroad purchased a lathe during the week and has specifications out covering two other tools.

An eastern Massachusetts textile machine manufacturer closed for two tools and is still in the market. A large amount of school buying is expected during July for new high schools and technical schools which are now building. New England machine tool builders are now feeling the effects of the quiet buying which has continued through nearly all of June and operating schedules in some places have been curtailed. Builders with sales offices scattered throughout the country report a falling off in sales in nearly all of the eastern offices with midwest and far west orders holding about stationary. Special machinery is in strong demand. This is particularly true for box and package machinery, for sheet metal working machinery, and for paper mill equipment. Demand for cans and tin receptacles is heavy and machinery for making these is moving freely. Electric motors are in heavy demand and motor manufacturers are all busy. Mining and hoisting machine manufacturers are busy and at least one prominent concern is in the market for machine tools.

Equipment Business Dull

CHICAGO, July 3.—Sellers of machine tool equipment in Chicago find business dull, a condition which is usually met at this season, but which seems more marked now than usual. March was the heaviest month of this year, just preceding the increase in quotations, and each month since has seen the volume of selling decrease steadily. Those who come in contact with machine tool users find that one reason for lessened buying is the difficulty in obtaining sufficient workers to man the machines they already have. This, of course, is a strong argument against purchasing equipment, while it is also thought by many users that present prices are too high and that they will be reduced later. This argument seems fairly well grounded, in view of the fact that some sellers are cutting prices more or less severely. In fact, sales of equipment to railroad companies have come to be little better than auctions, with various dealers bidding against each other and at times disposing of their equipment at much below the published list. Although a number of railroads have taken quotations on considerable lists no buying has been done since that of the Chicago & Northwestern railroad a fortnight ago. The Burlington railroad has its bids ready for tabulation and the matter is moving steadily toward the purchasing agent. Other roads have not moved definitely toward filling their requirements.

Bulletin Board

Requests for Equipment and Supplies, Trade Literature, Etc., Made Through IRON TRADE REVIEW

The B. & C. Mfg. Co., Inc., 290 Church street, New York, has received an inquiry from abroad for catalogs and price lists of accessories used in the drawing of metal. It is desirous of getting in touch with manufacturers of such accessories.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

WINDSOR LOCKS, CONN.—Work has been started on a 4-story and basement manufacturing building, 55 x 100 feet, for C. H. Dexter Co.

TALLAHASSEE, FLA.—The Tallahassee Iron Works, Inc., has started rebuilding its plant which recently was damaged by fire.

CHICAGO.—The Stewart-Warner Speedometer Corp., 1828 Diversey Parkway, plans a 6-story plant extension, 217 x 241 feet.

CHICAGO.—The Mojonnier Bros. Co., 739 West Jackson boulevard, manufacturer of dairy machinery, plans a 1-story factory building, 124 x 200 feet, to cost about $25,000.

CHICAGO—The Quality Hardware & Machine Co., 6158 North Clark street, has let a contract for a 1-story machine shop, 48 x 160 feet, to cost about $30,000.

CHICAGO—The American Aniline Products, Inc., 1818 South Clark street, has been incorporated with $100,000 capital stock by W. J. Lonorgan, H. A. Dodge, M. A. West, Frederick Trowbridge and Chester A. Scheidler to manufacture and deal in chemical products. The company is represented by Gallagher, Kohlsaat, Rinaker & Wilkinson, 11 South La Salle street.

CHICAGO.—The Yellow Cab Mfg. Co., 5801 Dickens avenue, has let a contract for a 1-story, 2-story and 3-story manufacturing building, to cost $260,000.

CLEARING, ILL.—The Central Brake Shoe & Foundry Co., Railway Exchange building, Chicago, plans a 1-story foundry building here.

EAST CHICAGO, IND.—The Bates Standard Steel Truss Co. is erecting an experimental and testing plant adjoining its works here.

EVANSVILLE, IND.—The Graham Bros. Truck Co. plans a factory building to cost $50,000.

HUNTINGTON, IND.—The Orton-Steinbrenner Co., plans a 1-story machine shop addition, 100 x 240 feet to cost $75,000.

RICHMOND, IND.—The Fiber Conduit Co. of Orangeburg, Ky., plans a plant here at an estimated cost of $200,000.

SOUTH BEND, IND.—The George Cutter Mfg. Co., 401 North Notre Dame avenue, contemplates a factory building.

BOSTON.—The Magee Furnace Co. is converting a plant at Taunton, Mass., for use as a foundry.

BOSTON.—The Star Boiler Works, 109 Albany street, is erecting a 4-story plant building, 20 x 60 feet.

BOSTON.—The J. L. Mott Iron Works, Inc., 118 Fifth avenue, New York, plans to establish a plant here.

BOSTON.—The Hopkins Mfg. Co., builder of machinery, is to erect a brick, 1-story, 30 x 60-foot factory in the Brighton district.

BOSTON—William H. Griffiths & Co., Inc.,

has been incorporated to build machinery with $50,000 capital by Leo J. Griffin, Wollaston, Mass., Charles E. Davis, Cambridge, Mass., and Patrick J. Griffin.

EVERETT, MASS.—Subcontracts have been awarded for four shop buildings for the Boston Elevated railway.

MONSON, MASS.—The Rubwood Wheel Co., Inc., plans a 2-story factory building, 50 x 80 feet, to cost about $65,000. H. N. Atwood is president of the company.

SAUGUS, MASS.—The Eastern Tool & Stamping Co. has been incorporated to build machinery with $50,000 capital by Helmer G. Josephson, Adolph E. Dahlin and Harry I. Thompson, all of Lynn, Mass.

WEST SPRINGFEILD, MASS.—The A. S. Cann Co., disk wheels, etc., plans a plant building.

BALTIMORE.—The Porcelain Enamel & Mfg. Co., plans a 1-story plant building, 100 x 520 feet.

BALTIMORE.—The Safety Electric Lantern Co., 623 Calvert building, plans to establish a plant for the manufacture of lanterns, etc.

ANN ARBOR, Mich.—The Automotive Utilities Corp., Detroit, has purchased the property of the Ann Arbor Machine Co. including the buildings and seven acres of ground. It plans to occupy the premises soon.

GRAND RAPIDS, MICH.—The Grand Rapids Refrigerator Co. has awarded a contract to Hansen, Wharton & Co., Grand Rapids, for a 3-story addition, 60 x 150 feet.

DETROIT—The Economy Baler Co., 1254 North Main street, contemplates a 1-story factory building, 60x100 feet.

DETROIT.—The Enamelight Co., 546 Book building, which recently was organized, plans to establish a plant here.

DETROIT.—The Peter Smith Heater Co., 739 Mt. Elliot street, plans plant additions to cost about $50,000.

DETROIT.—The C. M. Hall Lamp Co., 1033 East Hancock street, has awarded a contract to the E. Chase Co., Penobscot building, for a 1-story plant addition, 80 x 175 feet, to cost about $75,000.

LANSING, MICH.—The Capital Steel Co. has been organized with $50,000 capital stock to engage in a general warehouse business in iron and steel products. D. F. Stockbridge is president of the company.

DERRY, N. H.—The Progressive Shoe Machinery Co. is to erect a reinforced concrete, mill construction, 3-story, 40 x 100-foot factory addition.

BLOOMFIELD, N. J.—The Combination Rubber Mfg. Co., Franklin avenue, plans a 4-story plant building, 75 x 275 feet, for the manufacture of automobile tires and rubber products.

NEWARK, N. J.—The Essex Machine Repairing Co., 48 Marshall street, plans a 1-story addition to cost about $20,000.

NEWARK, N. J.—The Atlas Fence Co., 1 Clinton street, has been organized with $25,000 capital stock. Frank C. Zuch is president of the company.

BINGHAMTON, N. Y.—The Dunn-Cooper Corp., Madison avenue, manufacturer of metal patterns, plans a plant addition to cost about $25,000.

BROOKLYN, N. Y.—The Robert Findly Mfg. Co., 900 Lexington avenue, plans alterations to its plant to cost about $20,000.

BROOKLYN, N. Y.—The Kings County Lighting Co., 4802 New Utrecht avenue, plans a 1-story power house, 57 x 88 feet, to cost $60,000.

BROOKLYN, N. Y.—The Belmont Smelting & Refining Works has been incorporated with $10,000 active capital stock by G. and V. Henning and L. O. Jury. The company is represented by Thornton & Earle, 15 William street.

BUFFALO.—John Klein plans the erection of a 2-story machine and repair shop, 50 x 140 feet, at 575-89 Tonawanda street.

BUFFALO—The David Bell Co. has been

Industrial Business Changes Recently Announced

THE Matlack Coal & Iron Co., Inc., with general offices at 44 Beaver street, New York, recently was appointed exclusive American sales agent for the sale of imported iron ore controlled by the N. V. Handels en Transport Maatschappy Vulcan of Rotterdam.

* * *

Removal of its plant from Plainville, Conn., to Terryville, Conn., recently was completed by the Fletcher Terry Co.

* * *

New sales offices at 431 South Dearborn street, Chicago, have been opened by the Champion Engineering Co., Kenton, O., with W. B. McCracken in charge.

* * *

The iron and steel business of Abeel Bros., 190 South street, New York, has been purchased by C. F. Fay, who will be in active charge.

* * *

The American Steel Foundries has leased the fifteenth and sixteenth floors of the Wrigley Annex building, Chicago, for 10 years, commencing May 1, 1924. At that time the company will remove its general offices from the McCormick building where they have been located for many years.

* * *

The scrap metal refinery department of the American Brass Co. is to be removed from Ansonia, Conn., to its branch plant at Perth Amboy, N. J.

* * *

The Economic Machinery Co., Worcester, Mass., recently sold its property at School and Union streets and will move to quarters in the Osgood Bradley building, 18 Grafton street, Worcester.

* * *

Waldo, Egbert & McClain, Inc., Buffalo and Boston, are sole agents for the Superior Sheet Steel Co., Canton, O., in western New York and surrounding districts.

* * *

Offices of Manning, Maxwell & Moore, Inc., New York, after July 1 will be located in the Pershing Square building, 100 East Forty-second street, New York City.

* * *

The McWane Cast Iron Pipe Co., Birmingham, Ala., has opened a southwestern branch sales office at Dallas, Tex., in charge of J. L. Hill. This office will handle sales in the Southwest and Mexico.

* * *

New England sales offices have been opened by the General Refractories Co., Philadelphia, at 200 Devonshire street, Boston, in charge of M. C. Sargent.

* * *

The Colonial Supply Co., Pittsburgh, has been appointed exclusive distributor in the western Pennsylvania territory for the Latrobe Tool Co., Latrobe, Pa., manufacturer of high speed, drills and reamers.

* * *

Announcement has been made that the Indianapolis Pump & Tube Co., will move from its plant at Kentucky avenue and Drover street, Indianapolis, to a new plant in Greenwood, Ind.

* * *

Permanent offices have been opened at 1702 Jefferson County Bank building, Birmingham, Ala., by the Whiting Corp., Harvey, Ill., which recently opened a Birmingham district sales office in temporary quarters at 1526 that building.

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	4.30c
New York	3.54c
Philadelphia	3.55c
San Francisco	4.00c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	4.40c
New York	3.64c
Philadelphia	3.65c
San Francisco	4.10c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	4.45c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.45c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.75c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.25c
Seattle	4.75c
St. Louis	4.45c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.75c
Buffalo	5.25c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.75c
Detroit	5.15c
Los Angeles	6.50c
New York	5.15c
Philadelphia	5.15c
San Francisco	6.30c
Seattle	5.75c
St. Louis	5.30c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.90c
Buffalo	6.35c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.80c
Detroit	6.30c
Los Angeles	7.30c
New York	6.05c to 6.15c
Philadelphia	6.25c
San Francisco	7.15c
Seattle	6.75c
St. Louis	6.45c

BANDS

Boston	4.80c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	5.20c
New York	4.39c
Philadelphia	4.35c
San Francisco	4.75c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.70c
Buffalo (shapes)	5.20c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angeles (rounds	5.25c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
San Francisco (rounds)	5.50c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.55c

incorporated to make screw machine products with $100,000 capital stock by D. and A. N. Bell and W. J. Dugan. The company is represented by attorneys, Wilcox & Van Allen.

JAMESTOWN, N. Y.—The Jamestown Regulator Co. has been incorporated with $25,000 capital stock by J. H. Miller, and R. S. Hayes. The company is represented by F. M. Garfield.

NEW YORK—The Otis Elevator Co. contemplates a 5-story factory building.

NEW YORK—The Crude Oil Vaporizer Co. has been incorporated with $100,000 capital stock by T. H. Barth, C. J. Nolan and C. E. Goehring. The company is represented by A. Taylor, Knowles & Hack, 165 Broadway.

NEW YORK—The Midwest Air Filters has been incorporated to make engines, etc., with $200,000 capital stock by W. J. Martin, F. H. Coper and W. Shea. The company is represented by Foley & Martin, 64 Wall street.

NEW YORK—The Interstate Baler & Wire Corp. has been incorporated with $20,000 capital stock by J. M. Abramson, M. R. Cotton and F. W. Kristeller. The company is represented by Watson, Kristeller & Swift, 68 William street.

SARATOGA, N. Y.—The Baker Mfg. Corp. plans a 1-story plant addition, 46x112 feet, to cost about $50,000.

SHELBY, N. C.—T. J. Babington has acquired a site on which he plans to erect a foundry building.

BELLAIRE, O.—The Carnegie Steel Co. has applied to the war department for permission to erect a loading and unloading dock, on which its plans to place a whirler crane hoist.

BELLEVUE, O.—The Bellevue Steel & Iron Co. has been incorporated with $10,000 capital stock by C. R. Phillips, A. W. Zeckman, L. O. Allen, B. D. Wyant and O. A. Overmeyer.

CINCINNATI.—The Correct Container Box Co. has awarded a contract for a plant at Carthage, O.

CLEVELAND—The American Ferrule & Mfg. Co. has been incorporated with $500 capital stock by Louis J. Kohn, Cleveland Discount building, H. C. Koontz, W. T. Findley, Joseph A. Klein and A. G. Levine.

IRONTON, O.—The Ironton Stove & Mfg. Co. plans a foundry addition.

KENTON, O.—The Daniel Husker & Implement Co., which recently was incorporated, plans to establish a plant here.

MASSILLON, O.—The Massillon Clay Products Co. has been incorporated with $125,000 capial stock by Walter T. Smith, Edward M. Ertle, Lucille Weible, John V. Hammersmith and Elson Wefler.

MARIETTA, PA.—The plant of the National Casting Co. recently was damaged by fire. It is planned to rebuild.

PHILADELPHIA.—The Philadelphia Gear Works, Inc., 1120 Vine street, has awarded a contract to A. Raymond Raff Co., 1635 West Thompson street, for a 1-story machine shop to cost about $35,000.

PHILADELPHIA—The General Electric Co., Schenectady, N. Y., plans a plant here, 191x604 feet.

PHILADELPHIA.—Edward Schoeppe, 315 South Fifteenth street, plans a 1-story machine shop.

PHILADELPHIA.—The North Bros. Mfg. Co., Lehigh and American streets, manufacturer of tools, plans a factory building.

PHILADELPHIA.—The Dodge Steel Co., State road and Hellerman street, has awarded a contract for a 1-story foundry addition to cost $23,000.

PHILADELPHIA.—Henry F. Sachsenmaier, Ashburner and Tulip streets, has awarded a contract to the Truscon Steel Co., Youngstown, O., for a machine shop to cost about $40,000.

SHARPSBURG, PA.—The National Engineering & Machine Co. contemplates a factory addition to cost about $50,000.

BRISTOL, R. I.—Bids closed July 3 for a 1-story, 60 x 180-foot addition over building No. 7 for the National India Rubber Co. of the U. S. Rubber Co.

MILWAUKEE—The Eslein Sheet Metal Works, 3707 Center street, plans to rebuild its plant recently damaged by fire.

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

West of the Mississippi River

HUENEME, CAL.—The Seibel Air Spring Co., Inc., plans a 1-story plant building, 100 x 200 feet, to cost $60,000.

SAN FRANCISCO.—The Pacific Gear & Tool Works, Inc., has awarded a contract to Matt N. Brady, Monadnock building, for a 2-story plant to cost about $52,000.

SAN FRANCISCO.—The Merganthaler Linotype Co., 638 Sacramento street, has awarded a contract to the Pioneer Concrete Co., 180 Jessie street, for a 3-story addition to cost about $75,000.

BETTENDORF, IA.—The Zimmerman Steel Co. recently increased its capital stock to $650,000.

CEDAR RAPIDS, IA.—The Viking Pump Co., 309 East Fourth street, is having plans drawn for a 1-story factory addition, 80x152 feet.

DAVENPORT, IA.—The Hawkeye Electric Power Co. has increased its capital stock from $150,000 to $300,000.

DAVENPORT, IA.—The American Sash Weight Foundry Co. plans to purchase the former plant of the Sears Tire & Equipment Co. on West Second street.

KANSAS CITY, KANS.—The Truswall Stone Co., Twenty-third and Flora streets, plans a 1-story plant, 150 x 250 feet, to cost about $40,000.

MINNEAPOLIS—L. D. Sisson Co., 712 Builders building, plans a 2-story factory addition, 36x128 feet to cost $15,000.

ST. CLOUD, MINN.—The state board of control plans a machine shop at the state reformatory to cost $8000.

KANSAS CITY, MO.—The Darby Boiler Works Co., Minnesota avenue and Third street, plans a 1-story plant building, 500 x 600 feet, to cost about $100,000.

BARTLESVILLE, OKLA.—The Central Machine & Tool Co. has been incorporated with $50,000 capital stock by Lee Morrison, Morris Schuman and David L. Thomas.

PORTLAND, OREG.—The City Iron Works, 107 North Second street, plans a 1-story machine shop to cost about $10,000.

PORTLAND, OREG.—Joseph Hirsch, 171 St. Claire street, plans a 1-story machine shop and power house to cost $21,000.

LUFKIN, TEX.—The Lufkin Machine & Foundry Co. plans a 1-story machine shop, 45 x 200 feet, at an estimated cost of $45,000.

SAN JUAN, TEX.—The Orchard Fire-Pot Foundry Co. has been incorporated with $6000 capital stock by P. M. Perkins, Helen Perkins and B. L. Miller.

AUBURN, WASH.—The Washington Engine Works has been incorporated with $500 capital stock by H. E. Baldwin, J. F. Payne and E. M. Okins.

SPOKANE, WASH.—The Arsneau Power Saw Co. has been incorporated with $20,000 capital stock to engage in the manufacture of a chain drag saw operated by a gasoline motor.

VANCOUVER, WASH.—The Northwestern Electric Co. has authorized the construction of a power substation to cost $80,000. Additional improvements will cost about $50,000.

Business in Canada

WINNIPEG, MAN.—Mumford-Medland, Ltd., has been incorporated to manufacture machinery, general hardware, etc., with $50,000 capital stock by Charles R. Medland, George T. Mumford, Edward C. Medland and others.

BARRIE, ONT.—The Canadian Smoke & Gas Burner, Ltd., has been incorporated to manufacture smoke consuming devices, etc., with $300,000 capital stock, by George D. Brown, Walber Sarjeant and William C. Hunter.

GUELPH, ONT.—The Gringer Electric Co., Ltd., has been incorporated with $25,000 capital stock by Leo W. Goetz, A. C. Dunbar and H. M. McTague.

TORONTO, ONT.—Stanley & Bunting, Ltd., have been incorporated to manufacture and deal in automobiles, engines, motors, machinery, etc., with $100,000 capital stock; by Joseph Stanley, William Bunting, both of Toronto; John Bridge, George H. Pelton, both of London, Ont., and others.

TORONTO, ONT.—The Henry Engineering Co., Ltd., has been incorporated with $50,000 capital stock by Meril MacDonald, G. W. Adams, Percy E. Smily and others.

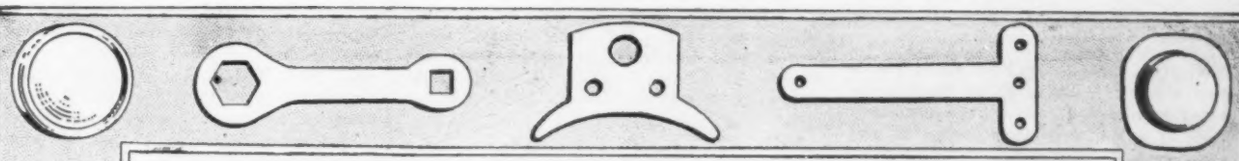
TORONTO, ONT.—The Yellow Car, Ltd., has been incorporated to manufacture automobiles, etc., with $200,000 capital stock by Harold W. A. Foster, William J. Benton, Henry M. Cody and others.

TORONTO, ONT.—Sepco Automatic Electric Heaters, Ltd. has been incorporated to manufacture electrical and mechanical water heaters, etc., with $40,000 capital stock. Provision directors include Charles W. Burns.

Composite Market Record

Monthly Averages of Fourteen Iron and Steel Products, 1913-1923, Compiled by Iron Trade Review

1923	
June 20	$46.43
June 13	46.53
June 6	46.79
Average for May	47.52
May 29	47.26
May 16	47.48
May 8	47.70
May 2	47.70
April	47.01
March	45.31
February	42.61
January	41.17
1922	
December	40.53
November	42.08
October	43.60
September	43.79
August	39.79
July	37.50
June	36.96
May	36.49
April	34.42
March	32.97
February	32.86
January	33.35
Average for year	37.86
1921	
December	33.99
November	34.71
October	35.46
September	35.34
August	35.99
July	38.14
June	41.87
May	43.32
April	43.84
March	45.37
February	48.81
January	51.98
Average for year.	40.74
1920	
December	54.04
November	63.75
October	68.61
September	69.28
August	68.93
July	68.29
June	67.89
May	68.26
April	67.49
March	65.47
February	65.63
January	59.40
Average for year.	65.59
1919	
December	54.88
November	51.28
October	48.76
September	48.35
August	48.27
July	47.86
June	47.88
May	48.29
April	48.45
March	52.28
February	53.71
January	53.81
Average for year.	50.32
1918	
December	57.24
November	55.67
October	57.53
September	56.56
August	56.67
July	56.66
June	56.62
May	56.59
April	56.59
March	56.71
February	56.67
January	56.67
Average for year.	56.68
1917	
December	56.68
November	58.29
October	67.75
September	83.18
August	89.69
July	89.56
June	82.66
May	73.96
April	66.48
March	61.07
February	56.76
January	55.10
Average for year.	70.10
1916	
December	$53.68
November	46.77
October	41.50
September	39.97
August	39.67
July	38.37
June	39.63
May	39.78
April	39.13
March	37.18
February	35.63
January	33.66
Average for year.	40.50
1915	
December	31.56
November	28.64
October	26.19
September	25.55
August	24.77
July	24.25
June	23.74
May	22.89
April	22.66
March	22.71
February	22.21
January	21.90
Average for year.	24.76
1914	
December	$21.58
November	23.39
October	22.84
September	23.17
August	22.72
July	22.17
June	22.58
May	22.99
April	23.39
March	23.60
February	23.52
January	23.03
Average for year.	22.92
1913	
December	23.29
November	24.02
October	24.91
September	25.55
August	25.97
July	26.34
June	26.78
May	27.34
April	27.74
March	27.93
February	28.05
January	27.96
Average for year.	26.32



Budd Stampings

If we show you how to cut out that 20 or 30 per cent scrap loss—

And if we show you how to rid yourself of that costly but avoidable expense known as DIE MAINTENANCE—

Should we not then be taken into your confidence and given an opportunity to show you the excellence of our workmanship?

Here is the situation, exactly:

Scrap loss is one of the big expenses of stamping. THE BUDD COMPANY'S Specialty Department, by skillful designing of dies and direction of operations, is able to reduce scrap loss to so small a percentage that it is practically negligible.

And here is another item of no mean importance:

You are aware, of course, that die *upkeep cost* is one of the principal items entering into the cost of stampings. When THE BUDD COMPANY makes your stampings you are immediately relieved of this expense, because THE BUDD COMPANY assumes the entire responsibility for die *maintenance* and *replacement cost*.

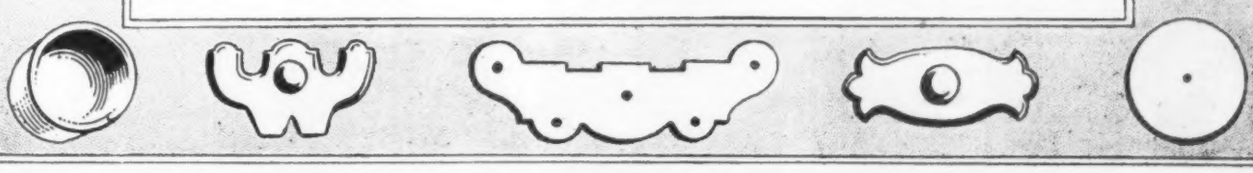
Here then are two excellent reasons why THE BUDD COMPANY'S stampings will save you money. Excellent quality is another.

May we submit estimates on your requirements?

Just send us samples or drawings.

ADDRESS
SPECIALTY DEPARTMENT
EDW. G. BUDD MFG. CO.
Makers of All-Steel Automobile Bodies
PHILADELPHIA, PA.

A Very Attractive Cost Reduction



Ernest V. McKague and Harry D. Anger of Toronto.

WINDSOR, ONT.—The Ford Motor Co. is erecting a factory building at its plant at an estimated cost of $500,000, for the distillation of coal by a low temperature process to produce a substitute for gasoline.

MONTREAL, QUE.—Security Fence Co., Ltd., has been incorporated to manufacture metals, wire, wire nails, wire cables, wire fencing, etc., with $100,000 capital stock, by Francis J. Laverty, Charles A. Hale and Shirley G. Dixon of Montreal and others.

MONTREAL, QUE.—Griswold & Co., Ltd. has been incorporated to manufacture machines, machinery, plate tools, utensils, etc., with $50,000 capital stock, by Henry N. Chauvin, Harold E. Walker and Jean Martineau of Montreal and others.

OTTAWA, ONT.—The Canadian house of commons has given a third reading to the bill authorizing an appropriation of approximately $29,000,000 for the completion and construction of new branches of the Canadian National railways, covering a period of three years.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent	13.25 to 16.50

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	nominal
Algerian low phosphorus, 52 to 54 per cent	nominal
Swedish and Norwegian low phosphorus, 68 per cent	nominal
Swedish foundry or basic, 66 to 68 per cent	11.25
Spanish foundry or basic, 50 to 54 per cent	nominal

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent	nominal
Indian, minimum 47 per cent	42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent	
Caucasian, 53 to 55 per cent.	nominal

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per net ton	$20.00 to $23.50

Rivets

Structural rivets, Pittsburgh	3.15c to 3.25c
Boiler rivets, Pittsburgh	3.25c to 3.35c
Rivets, 7/16-in. and smaller	60 and 10 to 60 and 5 off

Nuts and Bolts

NUTS

(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank	$3.25 to $3.50 off list
Hot pressed square or hexagon tapped	$3.00 to $3.25 off list
Cold punched square or hexagon blank	$3.25 to $3.50 off list
Cold punched, square or hexagon,	$3.00 to $3.25 off list
Cold punched semifinished hexagon nuts ⅜-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts 9/16-inch and smaller	70-10-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	50 and 10 off
Cut thread	50 off
Larger and longer	50 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	60 off
Cut thread	50 and 10 off
Larger and longer	50 and 10 off

(¾ x 4 inches, cold punched nuts)

Cut thread	45 off
Larger and longer	45 off
Lag screws	60 off
Plow bolts Nos. 1, 2 and 3 heads	50-5 off
4 to 10 heads	50-5+20 off
Stove bolts	75-5 off
Tap bolts	25 off
Bolt ends with hot pressed nuts	50-10 off
Bolt ends with cold punched nuts	45 off
Blank bolts	50 and 10 off
Rough stud bolts with nuts	50 off

WASHERS

Wrought washers	$4.85 to $5.00 off

Steel Pipe

(First column*—effective March 19, 1923)
(Second column—effective April 19, 1923)
*Wheeling Steel Corp. discounts.
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	44 to 45	18½ to 19½
¼ and ⅜-inch	50 to 51	24½ to 25½
½-inch	55 to 56	41½ to 42½
¾-inch	59 to 60	47½ to 48½
1 to 3-inch	61 to 62	49½ to 50½
Lap Weld		
2-inch	54 to 55	42½ to 43½
2½ to 6-inch	58 to 59	46½ to 47½
7 to 8-inch	55 to 56	42½ to 43½
9 and 10-inch	54 to 54	41½ to 41½
11 and 12-inch	54 to 53	41½ to 40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	59 to 60	47½ to 48½
Lap Weld		
2-inch	52 to 53	40½ to 41½
2½ to 6-inch	56 to 57	44½ to 45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	40 to 41	23½ to 24½
¼ and ⅜-inch	46 to 47	29½ to 30½
½-inch	52 to 53	41½ to 42½
¾-inch	57 to 58	46½ to 47½
1 to 1½-inch	59 to 60	48½ to 49½
2 to 3-inch	60 to 61	49½ to 50½
Lap Weld		
2-inch	52 to 53	41½ to 42½
2½ to 4-inch	56 to 57	45½ to 46½
4½ to 6-inch	55 to 56	44½ to 45½
7 to 8-inch	51 to 52	38½ to 39½
9 and 10-inch	45 to 45	32½ to 32½
11 and 12-inch	45 to 44	32½ to 31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	41 to 42	31½ to 32½
¾ to 1½-inch	44 to 45	34½ to 35½
2 to 2½-inch	46 to 47	36½ to 37½
Lap Weld		
2-inch	40 to 41	31½ to 32½
2½ to 4-inch	42 to 43	33½ to 34½
4½ to 6-inch	41 to 42	32½ to 33½
7 to 8-inch	37 to 38	24½ to 25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)

Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

	Black	Galvanized
Butt Weld		
⅛ and ¼-inch	+11	+39
⅜-inch	22	2
½-inch	28	11
¾-inch	30	13
1 to 1½-inch		
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 8-inch	28	13
9 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

Butt Weld		
⅛ and ¼-inch	+19	+54
⅜-inch	21	7
½-inch	28	12
¾-inch	30	14
1 to 1½-inch		
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)

(Effective April 19, 1923)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON

(Effective April 12, 1923)

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN

(Effective April 19, 1923)

1-inch	51 off
1¼ and 1½-inch	43 off
1¾-inch	27 off
2 and 2¼-inch	18 off
2½ and 2¾-inch	28 off
3 and 3¼-inch	32 off
3½ and 3¾-inch	33 off
4-inch	37 off
4½ and 5-inch	29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch	34 off
3½ and 3¾-inch	35 off
4-inch	39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	83 off
Carbon, 0.30 to 0.40 per cent	81 off
Carbon, 0.40 to 0.50 per cent	80 off

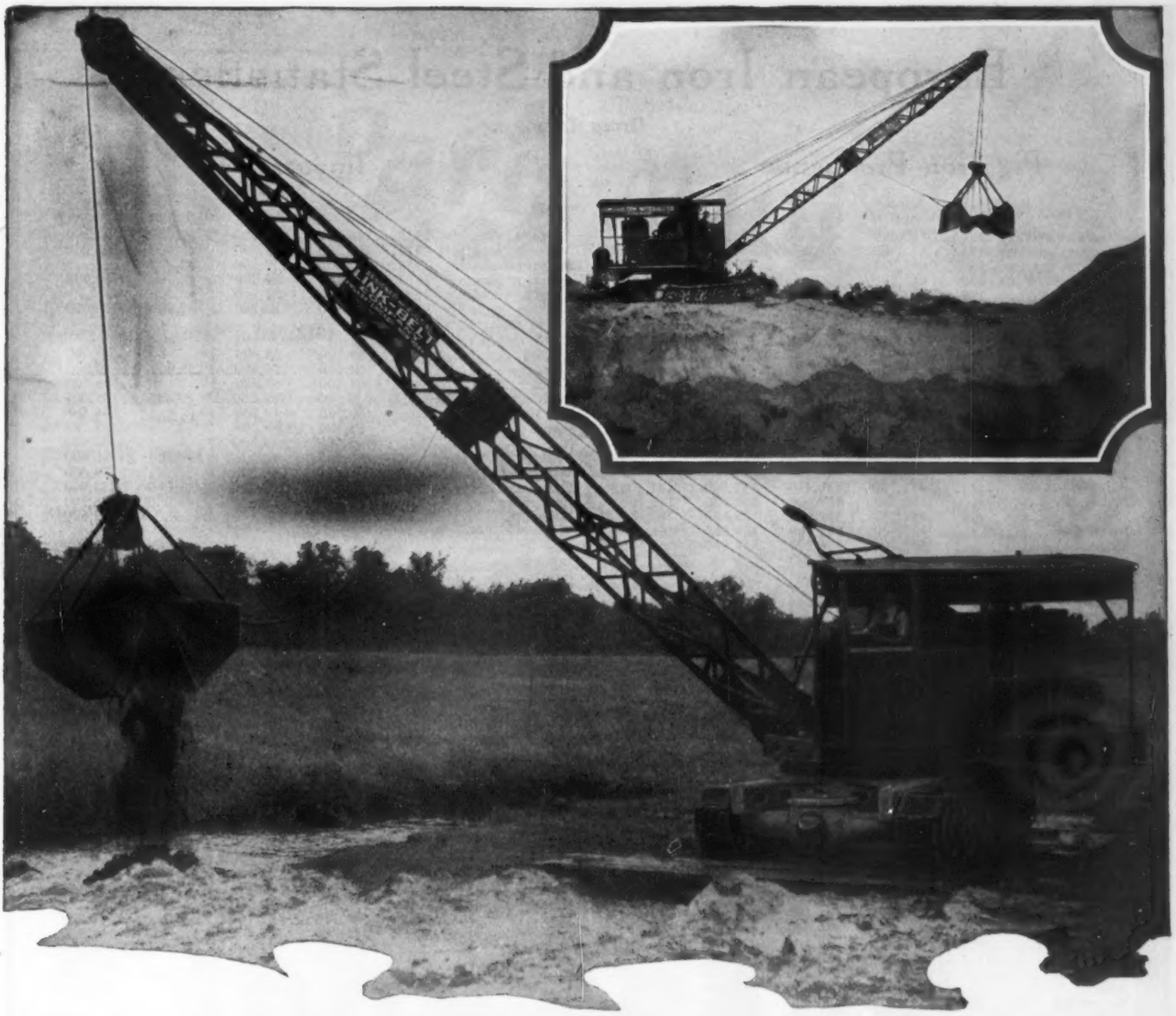
Plus differentials and extras for cutting

SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES

(Effective April 19, 1923)

Outside diameter	Gage	Net prices per foot, f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅜-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.



Link-Belt Quality in an All-Purpose Crawler Crane

SOUND in engineering principles and construction, durability, strength and long life—these are characteristic of Link-Belt products.

The Link-Belt Crawler Crane is no exception. It is mechanically right, easily operated by one man, and is designed for a wide range of usage.

It can make four complete rotations per minute, travels one mile per hour, and can easily climb a 25 per cent. grade.

It weighs 27 tons. Will lift 12 tons at 12 ft. radius, or 3½ tons at 30 ft. radius. Operates with any type of bucket, and can also be used with electric lifting magnet, or pile driver attachment.

Write for specifications, price and delivery date. Send for book No. 595.

1141

LINK-BELT COMPANY

PHILADELPHIA, 2045 Hunting Park Ave.

CHICAGO, 300 W. Pershing Road

INDIANAPOLIS, Belmont Ave. at Big Four R. R.

New York	Woolworth Bldg.	Wilkes-Barre	2d Nat'l Bank Bldg.	Seattle	820 First Ave., S.	Atlanta, 610-611 Citizens and S'thrn. Bk. Bldg.
Boston 9	49 Federal St.	Huntington, W. Va.	Robson-Prichard Bldg.	Portland, Ore.	101 First St.	Louisville, Ky., Frederick Wehle, Starks Bldg.
Pittsburgh	335 Fifth Ave.	Cleveland	429 Kirby Bldg.	San Francisco	168 Second St.	New Orleans, C. O. Hins, 504 Carondelet Bldg.
St. Louis	Central Nat'l Bank Bldg.	Detroit	4210 Woodward Ave.	Los Angeles	163 No. Los Angeles St.	Birmingham, Ala.,
Buffalo	745 Ellicott Square	Kansas City, Mo.	306 Elmhurst Bldg.	Denver, Lindrooth, Shubart & Co., Boston Bldg.		S. L. Morrow, 720 Brown-Marx Bldg.

Canadian Link-Belt Co., Ltd., Toronto and Montreal

H. W. CALDWELL & SON CO., CHICAGO NEW YORK, Woolworth Bldg. DALLAS, TEXAS, 709 Main St.

LINK-BELT

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912.	729,000	405,000	192,000	184,800
Monthly average 1913.	855,000	427,000	203,800	209,000
Monthly average 1919.	617,000	198,000	20,600	50,000
Monthly average 1920.	669,500	281,700	92,700	58,000
Monthly average 1921.	217,600	280,300	71,800	79,600
Monthly average 1922.	403,300	428,900	131,500	137,500
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	421,400	125,200	147,800
August	411,700	440,400	151,500	147,800
September	430,300	454,600	160,600	149,400
October	481,500	495,600	172,000	162,600
November	493,900	505,500	169,600	151,300
December	533,700	506,200	157,900	156,700
1923				
January	567,900	478,600	157,800	139,500
February	543,400	300,800	149,000	86,500
March	633,600	311,200	167,300	93,900
April	652,200	345,000	169,600	94,400

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912.	566,000	363,000	206,000	79,400
Monthly average 1913.	639,000	385,000	202,300	109,000
Monthly average 1919.	658,000	179,000	27,400	32,000
Monthly average 1920.	755,600	250,200	101,300	49,000
Monthly average 1921.	302,100	254,500	65,000	62,300
Monthly average 1922.	486,000	372,000	128,200	114,000
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	116,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	362,900	112,500	125,600
August	528,400	390,300	149,100	129,200
September	555,900	400,300	154,900	132,600
October	565,201	423,000	179,600	136,800
November	600,800	404,100	174,600	130,200
December	546,100	408,100	166,700	131,600
1923				
January	634,100	401,400	159,800	121,500
February	707,100	285,300	154,700	72,400
March	802,500	310,900	181,100	78,500
April	749,400	349,200	167,700	77,600

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912.	166,400	16,400	87,000	27,300
Average monthly 1913.	185,900	12,900	68,900	25,000
Average monthly 1919.	42,400	113,100	44,400	.....
Average monthly 1920.	92,400	89,000	67,000	26,200
Average monthly 1921.	137,100	38,500	43,300	.....
Average monthly 1922.	73,500	64,300	42,000	199,000
1922				
January	88,700	36,600		68,200
February	64,600	55,800	139,000	66,900
March	63,800	67,300		105,700
April	59,900	89,100	32,400	129,000
May	60,900	41,100	62,400	154,300
June	52,800	73,200		137,700
July	55,900	54,800		182,900
August	80,100	40,300	129,700	181,800
September	70,600	50,000		175,000
October	90,600	109,200		233,800
November	79,800	58,500	140,000	186,700
December	114,000	109,500		239,600
1923				
January	128,900	55,800	45,100	191,300
February	122,700	63,800	46,000	82,500
March	111,000	38,000	.....	.....
April	115,400	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912.	400,600	41,500	124,500	482,400
Average monthly 1913.	414,100	48,200	128,800	516,900
Average monthly 1919.	186,100	19,400	14,500	.....
Average monthly 1920.	270,900	74,600	74,300	143,600
Average monthly 1921.	141,700	132,700	75,900	176,000
Average monthly 1922.	283,400	164,000	143,000	209,700
1922				
January	235,300	164,000		218,200
February	223,400	107,000	198,400	170,000
March	295,800	72,300		208,700
April	258,400	125,800	83,900	195,500
May	272,400	122,200	279,600	204,500
June	236,300	180,300		209,132
July	251,700	182,100		206,200
August	270,000	168,400	522,600	181,300
September	279,200	174,000		223,500
October	347,100	235,600		229,908
November	372,300	181,300	631,200	210,000
December	114,000	221,700		258,900
1923				
January	353,400	158,500	202,200	212,900
February	317,600	236,500	162,200	183,500
March	368,100	139,200	.....	.....
April	387,000	.....	.....	.....

Note—Belgian figures include Luxemburg since June 1, 1922.

*Provisional estimate. Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1923		
May	75,840	195,535
April	77,894	183,905
March	106,050	168,176
February	67,682	135,046
January	119,955	134,441
1922		
December	96,358	154,087
November	152,250	124,004
October	184,202	131,542
September	76,393	128,370
August	49,054	144,264
July	62,426	157,027
June	39,154	216,298
May	23,098	229,616
April	18,720	197,562
March	12,774	206,474
February	11,535	133,333
January	13,404	155,962
Total	643,010	1,988,539
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	516,447
Total	117,105	2,156,818
1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
1919	327,490	4,405,281
1918	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687

Paris-Midi
Téléphone : Cut. 55-92
30, rue Louis-le-Grand
15 Centimes
MARDI 27 MARS 1923
OÙ NOUS EN SOMMES CE MATIN :
VOICI LE PROGRAMME DE LA JOURNÉE
Le marché métallurgique des Etats-Unis
La revue The Iron Trade Review nous communique le cable reçu de ses services de Cleveland, concernant le marché métallurgique des Etats-Unis.
La production de fonte pour janvier atteint 3.226.000 tonnes, chiffre le plus élevé depuis octobre 1920; 261 hauts fourneaux sont en activité. La demande en acier croit de plus en plus. De nouvelles usines de transformation sont inactives par suite du manque de demi-produits. Les tubes accusent une hausse de 4 à 6 dollars par tonne. Les tôles, rails et les profilés ont augmenté de 2 dollars et plus. La production de l'industrie automobile est au maximum, atteignant 10 à 11,000 voitures par jour, et limitée par le manque d'acier. Pendant le mois de janvier les chemins de fer ont commandé 13,000 wagons et 600 locomotives. Grosse demande en aciers de construction. La "Standard Oil Company", de New Jersey, a acheté récemment 400,000

Paris Midi is a daily newspaper published in Paris.

It is issued at noon and gives the latest morning news.

It is a first-class newspaper with a large circulation.

400 Newspapers Regularly Quote

IRON TRADE REVIEW

CLEVELAND

The international reputation and the World-wide circulation of the IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF-

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	15.00 to 16.00
Boston (dealers)	13.50 to 14.00
Buffalo	20.00 to 20.50
Chicago	17.50 to 18.00
Cleveland	18.00 to 18.50
Cincinnati	15.50 to 16.00
Detroit (dealers)	15.00 to 16.00
Eastern Pennsylvania	17.50 to 18.50
New York (dealers)	13.50 to 14.00
Pittsburgh	20.00 to 20.50
St. Louis	17.00 to 17.50
Valleys (nominal)	20.75 to 21.00
No. 1 railroad steel New York (dealers)	14.00 to 14.50

BUNDLED SHEETS

Buffalo	$16.25 to 16.75
Cleveland	12.75 to 13.00
Cincinnati	12.50 to 13.00
Detroit	12.50 to 13.00
Eastern Pennsylvania	16.00 to 16.50
Pittsburgh	17.50 to 18.00
St. Louis	11.00 to 11.50
Valleys	15.00 to 15.50

STEEL RAILS, SHORT

Birmingham	17.50 to 18.00
Boston (dealers)	14.50 to 15.00
Chicago	20.00 to 20.50
Cincinnati	22.00 to 22.50
Cleveland	17.00 to 17.25
St. Louis	17.00 to 17.50

STOVE PLATE

Birmingham	15.00 to 16.00
Boston	17.00 to 18.00
Buffalo	20.00 to 21.00
Chicago	16.50 to 17.00
Cincinnati (net tons)	10.50 to 11.00
Cleveland	16.00 to 16.25
Detroit (net ton) (dealers)	14.00 to 15.00
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	13.00 to 13.50
Pittsburgh	16.00 to 16.50
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo	26.00 to 27.00
Cincinnati	15.00 to 16.00
Eastern Pennsylvania	25.00 to 26.00
Pitts. billets and bloom crops	23.50 to 24.00

SHOVELING STEEL

Chicago	17.00 to 17.50
Pittsburgh	16.00 to 16.50
St. Louis	16.50 to 17.00

KNUCKLES, COUPLERS & SPRINGS

Chicago	22.00 to 22.50
Eastern Pennsylvania	23.00 to 24.00
Pittsburgh	21.50 to 22.00
St. Louis	22.00 to 22.50

COMPRESSED SHEETS

Buffalo	19.50 to 20.50
Chicago	15.50 to 16.00
Cleveland	16.00 to 16.50
Detroit (dealers)	13.50 to 14.00
Pittsburgh	18.00 to 18.50
Valleys	19.00 to 19.50

FROGS, SWITCHES, GUARDS

Chicago	17.00 to 17.50
Eastern Pennsylvania	17.50 to 18.50
St. Louis	16.50 to 17.00

BOILER PLATE, CUT

St. Louis	11.50 to 12.00

ANGLE BARS—STEEL

Chicago	18.50 to 19.00
St. Louis	18.00 to 18.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	15.00 to 15.50
Boston (dealers)	16.50 to 17.00
Buffalo	20.00 to 21.00
Chicago, No. 1	16.75 to 17.25
Chicago, No. 2	17.00 to 17.50
Cincinnati No. 1	13.50 to 14.00
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh, No. 1	17.50 to 18.00
Pittsburgh, No. 2	19.50 to 20.00
NewYork, No. 1 (dealers)	18.50 to 19.00
St. Louis, No. 1	17.00 to 17.50
St. Louis, No. 2	17.00 to 17.50

WROUGHT PIPE

Boston (dealers)	9.50 to 10.00
Buffalo	17.00 to 18.00
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	11.00 to 11.50

YARD WROUGHT

Boston	14.00 to 14.50
Eastern Pennsylvania	19.00 to 20.00

CITY WROUGHT

New York, long	$17.00 to 17.50

BUSHELING

Buffalo, No. 1	19.00 to 20.00
Chicago, No. 1	15.50 to 16.00
Chicago, No. 2	12.50 to 13.00
Cincinnati No. 1	12.00 to 12.50
Cleveland, No. 1	15.75 to 16.00
Cleveland, No. 2	11.50 to 12.00
Detroit, No. 1	13.00 to 13.50
Detroit, No. 2 (new)	12.00 to 12.50
Detroit, No. 2 (old)	11.00 to 11.50
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh, No. 1	16.50 to 17.00
St. Louis No. 1	16.00 to 16.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 10.00
Boston (dealers)	11.00 to 11.25
Buffalo	16.00 to 17.00
Chicago	10.00 to 10.50
Cleveland	15.75 to 16.00
Cincinnati (net tons)	10.00 to 10.50
Detroit (dealers)	10.00 to 10.50
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.50 to 13.00
Pittsburgh	15.00 to 15.50
St. Louis	12.00 to 12.50
Valleys	16.50 to 17.00

CAST IRON BORINGS

Birmingham (chemical	16.00 to 17.00
Birmingham (plain)	10.00 to 11.00
Boston (chemical)	14.50 to 15.00
Boston (dealers)	11.00 to 11.50
Buffalo	16.00 to 17.00
Chicago	14.00 to 14.50
Cincinnati (net tons)	10.00 to 10.50
Cleveland	16.25 to 16.50
Detroit (dealers)	12.50 to 13.00
Eastern Pennsylvania	15.50 to 16.50
Eastern Pennsylvania (chem.)	20.00 to 21.00
Pittsburgh	16.50 to 17.00
New York (dealers' price)	12.50 to 13.00
St. Louis	13.50 to 14.00
Valleys	17.50 to 17.75

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	10.50 to 11.00
Cleveland	16.00 to 16.25
Detroit (dealers)	12.00 to 12.50
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	12.00 to 12.50

IRON AXLES

Birmingham	25.00 to 26.00
Boston (consumers)	31.00 to 32.00
Buffalo	30.00 to 31.00
Chicago	29.00 to 29.50
Cincinnati	23.50 to 24.00
Eastern Pennsylvania	nominal
New York (dealers)	27.00 to 28.00
St. Louis	27.00 to 27.50

IRON RAILS

Buffalo	$23.00 to 23.50
Chicago	21.50 to 22.00
Cincinnati	14.50 to 15.00
St. Louis	18.50 to 19.00

PIPES AND FLUES

Chicago	12.50 to 13.00
Cincinnati	10.50 to 11.00
Cleveland	12.50 to 13.00
St. Louis	12.75 to 13.25

RAILROAD GRATE BARS

Buffalo	18.00 to 19.00
Chicago	14.50 to 15.00
Cleveland	16.00 to 16.25
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	13.00 to 13.50
St. Louis	15.50 to 16.00

FORGE FLASHINGS

Boston (dealers)	11.50 to 12.00
Chicago, small	12.50 to 13.00
Cleveland, small	15.25 to 15.50
Cleveland, large	15.00 to 15.25
Detroit (dealers)	11.00 to 12.00

FORGE SCRAP

Boston (dealers)	11.50 to 12.00
Chicago	17.00 to 17.50
Eastern Pennsylvania	16.00 to 17.00

ARCH BARS AND TRANSOMS

Chicago	26.50 to 27.00
St. Louis	24.00 to 25.00

ANGLE BARS—IRON

Chicago	26.50 to 27.00
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	12.00 to 13.00
Buffalo	22.50 to 23.00
Chicago	14.50 to 15.00
Cleveland	17.00 to 19.00
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	17.50 to 18.00
St. Louis	13.50 to 14.00

STEEL CAR AXLES

Birmingham	22.00 to 23.00
Boston (consumers)	24.00 to 25.00
Buffalo	24.50 to 25.50
Chicago	21.50 to 22.00
Cleveland	24.00 to 25.00
Eastern Pennsylvania	nominal
New York (dealers)	nominal
Pittsburgh	22.50 to 23.00
St. Louis	22.00 to 22.50

SHAFTING

Boston (consumers)	23.00 to 23.50
Chicago	24.00 to 24.50
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	20.50 to 21.00
St. Louis	22.50 to 23.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram c ar	19.50 to 20.00
Birmingham, iron	18.50 to 19.00
Boston (consumers)	22.00 to 23.00
Buffalo, iron	21.00 to 22.00
Chicago, iron	21.00 to 21.50
Cincinnati	16.50 to 17.00
Eastern Pennsylvania	22.00 to 24.00
New York iron (dealers)	18.00 to 19.00
Pittsburgh, iron	22.00 to 22.50
Pittsburgh, steel	21.50 to 22.00
St. Louis, iron	19.50 to 20.00

NO. 1 CAST SCRAP

Birmingham, cupola	20.00 to 20.50
Boston (consumers)	23.50 to 24.00
Buffalo	23.00 to 24.00
Chicago, cupola	23.75 to 24.25
Cincinnati No. 1 machinery cupola (net tons)	21.00 to 21.50
Cleveland, cupola	22.00 to 23.00
Detroit (net ton) (dealers)	17.00 to 17.50
Eastern Pennsylvania, cupola	22.00 to 23.00
New York, cupola (dealers)	19.00 to 20.00
Pittsburgh, cupola	22.00 to 22.50
San Francisco	26.00 to 28.00
St. Louis, railroad	20.00 to 20.50
St. Louis, agricultural	20.00 to 20.50
Valleys	22.50 to 23.00

HEAVY CAST

Boston (consumers)	20.00 to 21.00
Buffalo	18.00 to 19.00
Cleveland	15.00 to 15.50
Detroit (automobile) (net ton)	20.00 to 21.00
Eastern Pennsylvania	18.00 to 19.00
New York (dealers)	18.00 to 19.00
Pittsburgh	17.50 to 18.00

MALLEABLE

Boston (railroad) (consumers)	24.00 to 25.00
Buffalo	24.00 to 25.00
Chicago, railroad	23.00 to 23.50
Chicago, agricultural	22.00 to 22.50
Cincinnati, agricultural	17.00 to 17.50
Cincinnati, railroad	19.00 to 19.50
Cleveland, agricultural	22.00 to 22.50
Cleveland, railroad, nominal	25.00 to 25.50
Detroit (dealers)	21.00 to 22.00
Eastern Pennsylvania, railroad	20.00 to 22.00
Pittsburgh, railroad	22.50 to 23.00
St. Louis, agricultural	19.00 to 19.50
St. Louis, railroad	19.00 to 19.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	17.50 to 19.00
Boston (dealers)	16.50 to 17.00
Chicago	18.50 to 19.00
Cleveland	20.50 to 21.00
Detroit	15.00 to 15.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	20.00 to 20.50
Pittsburgh district	20.50 to 21.00
St. Louis	17.00 to 17.50

LOCOMOTIVE TIRES

Chicago	18.00 to 18.50
St. Louis	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	19.50 to 20.00
Eastern Pennsylvania	23.00 to 25.00
Pittsburgh	23.50 to 24.00